The Builder.

VOL. XVII.—No. 833.

The Homes of the Poor.

OUR earlier volumes brought this subject so constantly before the public that some of our readers, four or five years ago, thought it exhausted, and that sufficient improvements were being effected. What will they say now, when they see leading writers not merely describing similar unhealthy dens and their occupants, but literally the very same (Rose-alley, near Field-lane, Holborn, for example, as ably set forth recently in the *Times*), and showing, as we too have done, the existence of the same frightful state of things at the present time? The articles in question have stirred London, and have produced in reply an extraordinary subscription in aid of those who are in want. Admirable was the intention; noble has been the response. All honour be to those concerned:—

"Not the king's crown, nor the deputed sword,
The marshal's truncheon, nor the judge's robe,
Become them with one-half so good a grace
As mercy does."

From the cradle to the grave mankind need the aid of their fellows: we cannot exist without it,—high or low, rich or poor. It is a condition of our being: all who need aid have a right to ask it: none who is able to give it can refuse without danger.

Pecuniary aid, however, for those of whom we spoke, was not our object, as our readers know. What we had in view was to point out the causes which transform the poor to criminals, which sap alike their morals and their strength; to induce the adoption of sanitary improvements; and to bring to light some of the causes of evil largely in operation. It is to be hoped that they who have been moved to afford immediate aid may be led to examine into these causes.

If homes be looked into where the combined work of the family will barely amount, as is often the case, to fifteen shillings a week,—where the children are forced to labour at an early age, for prices which are decreasing every time some panic produces dulness in trade,—the question occurs, what is to become of those who are in this way reared up to employment which is so unprofitable that it will be out of their power, when they have arrived at years of maturity, to obtain at it, single-handed, a sufficient living?

The condition of the Spitalfields weavers and their families is melancholy in the extreme: not only have the weavers fallen into great poverty, but the winders of the threads and followers of some other subordinate divisions of this once important branch of English manufacture—women—can barely earn 1s. 6d. or 2s. a week. Of course, in such circumstances, these parties must either starve or depend on parish relief, or that from other sources. The sewing-machine will no doubt effect a change in the business of both the needle-women and tailors, who are already so much depressed that one feels inclined to wish that this or some other invention may render the use of human beings at such starving prices unnecessary. The engine applied to watch-making will affect many. The employment of children by capitalists in many fancy trades has been the means of depriving many respectable females of half their income. It would, indeed, require more space than can be given to mention the numerous agencies which are at work, adding each month to the mass of wretchedness and destitution in our large population. It is, however, sufficient for our present purpose simply to glance at the extent of the evil, which must be remedied by the exertions not only of the Legislature, but also of societies and individuals.

While looking at this dark and dreary aspect of London, we have not omitted to think of the sunny side of the picture—the improvement in the social position of the bulk of the people and the great increase of employment which has been brought about in other quarters by those very changes which, during a transition state, have produced so much misery.

The *Times* writer has described scenes such as we have again and again depicted, and has excited strong feeling on the subject. The statement made by the Rev. G. H. M'Gill, incumbent of St. George's-in-the-East, is equally startling. The Registrar-General shows that from privation, want of breast-milk (resulting from privation), neglect and cold, in 1848, 222 died; in 1849, 235; 1850, 211; 1851, 292; 1852, 304; 1853, 358; 1854, 380; 1855, 460; 1856, 414; 1857, 416—making a total, says the rev. gentleman, of 3,292 persons who had perished in London in ten years from absolute want of the necessaries of life; and it should be noticed that the deaths from this cause during the first of the above five years amount to 1,264, while in the more recent five years the number of deaths is 2,028 (very nearly double), and far above any increase which might be accounted for by growth of the population.

During the last twenty years a great change has taken place in public opinion respecting both sanitary and social reforms. The ragged schools are fulfilling their useful mission, and doing an amount of good that can only be estimated by those who have carefully examined the circumstances in which many thousands of the population are placed. The City Mission and other institutions; the exertions of district clergymen and surgeons, who not only do good in the practice of their vocations, but also by spreading a knowledge of matters which require change; the national schools, the savings' banks, and other associations connected with those most valuable establishments—are also most beneficial. The places of refuge for the destitute, and baths and wash-houses, are all instances of progress which it is gratifying to note. Still these different helps are not yet sufficiently developed, and if they were, would fail to reach the bottom of the mass of wretchedness which has accumulated. More, too, is needed in the way of wise help for those who at the present time, notwithstanding difficulties, remain honest, but who have little except begging, or worse, in prospect; and it is a matter demanding inquiry on the part of the Government if the support of industrial schools and encouragement to a more extensive plan of emigration would not be a saving of expense to the country at large.

We require more ample means of affording a chance for the employment of those who have the inclination, but have had no opportunity; and while feeling the difficulty there is in leading youths who have been accustomed to irregular habits to change, it is certain that the most hopeful way is to remove them from the scenes to which they have been accustomed, and where they are beset with temptations on all sides. The sea, the infant colonies, and the army, are means which might be made much more available than at present for the purpose of placing numbers who would be otherwise lost to society in comparative comfort.

Although a change has been made in the system of training the children in some of the metropolitan workhouses, still great improvement is required in those for the most part frightful establishments, in order to fit both boys and girls to undertake with chance of success industrious employment. The masters and mistresses of some of the schools connected with the workhouses may be without fault, but it seems to us that in too many of those establishments in which there are large numbers of children, the latter are left too much in the care of ignorant persons, who have, perhaps, for nearly their whole lives, been accustomed to pauperism. It is not from such custodians that little children will be likely to learn lessons of perseverance and self-reliance. Anything more frightful than the condition of workhouse society can scarcely be imagined. In other respects some boards of guardians might do much to ameliorate the condition of the very poor. We have seen instances of such treatment as to cause feelings of as much pity for those who could be so harsh and inhuman to suffering humanity, as for the unfortunates themselves. Many a family might have been saved from pauperism by a little kindly consideration on the part of those who have the management of the ratepayers' money. While saying this, we acknowledge that the attempts at imposition are numerous; but we have seen cases in which the good and the bad have all been used as though they were not of the same species as those who crowded them into passages, and pushed and drove them like so many sheep and oxen. Much good might be effected by right feeling on the part of relieving officers towards those who are in need of assistance.

Taking another road for a short distance,—it is noticeable that poverty and the sad results which in so many instances unfortunately follow it in large and dense populations, find a lodging-place in the suburbs; and that, as the capital increases, the hovels there and miserable houses give place to buildings of more substantial character, which are occupied by tenants of a better description. In Agar-town, King's-cross, the process of improvement is already beginning, and the substantial church and school there will, as the present leases fall out, be surrounded by rows of better-built houses, instead of those to which we have before directed attention.

It was not, two or three centuries ago, the fashion to build even in the suburbs such small and infamously slight houses as in Agar-town, the Kensington Potteries, and many other metropolitan districts; yet the poor managed to get hold of the outskirts. St. Giles's-in-the-fields and several other places might be mentioned; and the huts, in their turn, have given way to a fresh order of things. Other buildings have risen up, and the poorer classes have been driven to find abodes elsewhere. Some of these have gone to streets of decayed gentility, and rookeries as bad as St. Giles's have been formed in places which have the outward show of respectability.

It is curious to trace the decline of streets where, in Queen Anne's days, fashion and rank gladly took shelter. The first step in decline is generally the announcement that some professional gentleman has removed or commenced business; then some public institution is opened. On this the more aristocratic of the inhabitants move away, and in course of time the street is entirely occupied by various establishments. After this a fancy stationer, or silk mercer, and other dealers begin to fill windows with their goods. On this the higher class of professional men look for fresh quarters. The ordinary house windows are made into small and second-rate shop-fronts, some of which are occupied by dairymen and beer-shop keepers; then certain of the houses are let in tenements, and rows of bell-pulls, some of them with small brass plates below, show that the dignity of the street is still kept up by persons who can each afford to rent a set of apartments. The decline still continues: the shops become occupied by small dealers in general stores; from some, perhaps, a barber's pole is ventured forth; the bell-pulls gradually disappear, and a dense population, in most cases families living in single rooms, take possession of the street. This gradual succession of one rank after the other, and the desire as much as possible to imitate those just a step above, are the result of a natural, and in some degree commendable feeling; but it is attended with ill consequences in a sanitary point of view; for, as we have often before observed, those dwellings were not intended to be occupied by a multitude of families, and in the majority of instances the landlords take little care to improve them.

Generally speaking, independent workmen would refuse to wear the cast-off clothes of those above them, and yet they avail themselves in ninety cases out of a hundred of the cast-off houses of the upper classes, rather than choose

houses which are in every respect fit for the necessity of their own families. Workmen say that they cannot find the improved accommodation they require, and builders refer to some of the model structures which have been put up, and mention the smallness of the dividend which is made. It should be borne in mind, however, that extraordinary expenses have been incurred in the formation of the societies for improving the dwellings of the industrious classes, and that the cost of management and other charges are large. With proper management, healthy homes may be built to pay the owner.

Amongst the curiosities of this question may be noticed the various neighbourhoods inhabited by foreign people, who have sought shelter amongst us at different times. There are the French emigrants of Spitalfields, the Italian refugees of more recent date in the district near Gray's-inn-lane, the Germans in close streets about Whitechapel, and the miscellaneous crowd who form a familiar feature of the streets near Leicester-square. All these groups from various nations have peculiar interest, but none of them, to our mind, are more worthy of notice than the Jews, the most ancient of all the London immigrants, who in such large numbers gather together in Houndsditch and the parts surrounding.

We have before now remarked on the sanitary condition of the London Jews in poor districts, and noticed that, while fevers and other diseases have been cutting off numbers of their neighbours, the Jews have, to a remarkable extent, escaped the pestilence. We attributed this to the care taken as to the use of wholesome food, and their attention to cleanliness. Besides this, their practice as regards the interment of the dead is worthy of imitation; for not only do they provide burial-places outside the city (however large) that they inhabit, but on all, except very rare occasions, the corpse is placed in the ground within twenty-four hours after death. It seems remarkable that, with such an example before them, many of other creeds, in not much poorer circumstances, should keep the remains of their friends in their crowded dwellings for a week or ten days, and even a fortnight after death. This is, however, often caused by the difficulty of raising the money necessary for the expenses of the funeral. The Jews proceed, on the death of a poor member of their fraternity, immediately to raise a subscription of the sum needed, and it is not unusual to see a committee of Jews in the bustle of the clothes-market jingling a money-box, announcing the death of one of the trade, and collecting money, which amounts to a larger or smaller sum, according to the degree of respect in which the deceased was held. It is only some very notorious character or renegade who will not meet with this attention in time of need, and no poor Jew of Petticoat-lane can say a more cutting thing to another than "when your father died the box never went round for him." Other funds are provided by letting some of the seats in the synagogue at a high rent for this and similar charitable purposes.

Metropolitan taxation requires immediate revision. We have lately been in several of the more neglected London streets, and, listening to the opinions of persons of various classes, have found a strong feeling of discontent. The shopkeepers, taxed in some instances to nearly 6s. in the pound, must either raise the price of the food of the poor, or, as they say, "go to the workhouse themselves."

It is not our object to discuss the causes which have led to conditions so much to be lamented, but hope that thoughts of the great increase of pauperism in several parts of the metropolis will cause those who have the power to aid in remedying the evil, and to consider that the poorest neighbourhoods require the greatest amount of sanitary care, and that the frightful condition of the dwellings in those moral swamps is a prolific means of filling both workhouses and prisons. The owner of property in a part of the City where several of the tenants were suffering from fever, who was summoned not long ago before the authorities for sanitary neglect, said, so unprofitable was the place, that he would be glad to hand his rights in it to any responsible person, and give a handsome sum besides. The high rates make parties willing to let houses to a "farmer," at from 2*l.* 10s. to 5*l.* 10s. a year. Such circumstances are a means of continuing the use of houses which are unfit for human occupation, and we believe that the equalization of the poor-rates over the whole of London would have the effect of encouraging persons to provide improved dwellings in neighbourhoods where they are most required. At the present time, some of the inns of court, although surrounded by large masses of the poor, are not called upon for parish rates—the Bank of England, that wealthy corporation, is almost exempt—some of the great dock companies have bought up an entire parish, and are relieved from the poor—some rich parishes pay only about tenpence in the pound for poor-rates, and many other instances might be mentioned to show the necessity there is for change.

It has been shown that Rose-alley, already alluded to, is the constant abode of sickness, and that not long ago it was infested with measles, which spread from house to house. This is not to be wondered at when it is found that in many cases the cubic space afforded to the occupants is less than 150 feet per head. It has been proved that each person consumes about 14 cubic feet of air per hour, and by exhausting the vital element, oxygen, and producing carbonic acid to the extent of from four to five per cent. vitiates 100 cubic feet more. But the provision of this quantity would be so near upon the point of danger, that authorities are of opinion that twenty times this should be supplied per hour. The prisoners at Holloway receive from thirty to forty times this quantity, and the supply is not too large. In our public hospitals, from 1,000 to 1,700 cubic feet of space are allowed to each person, and when the area is lessened, injurious effects speedily follow. Dr. Bence Jones found that in the dormitories in St. Pancras workhouse, when only 164 cubic feet per head were allowed, the air contained about thirty times its proper amount of carbonic acid, and the closeness of the atmosphere was most oppressive, so that the inmates sickened of fever. Even in such of the barracks as have 500 cubic feet of space allowed, the air becomes charged with poisonous matter.

These and other statements of the same description are of value, inasmuch as they keep this important question before the public, and at the same time teach the multitude one of the most important means of promoting long life and health; and this is most necessary, for notwithstanding all that has been done, it is, unfortunately, still the case, that amongst a large majority of people sanitary science is but little understood. We therefore again make an effort to aid elementary instruction, by a few illustrations, not for the benefit of those who have studied this subject, but for those who have not given attention to this matter of life and death.

The annexed figure (1), drawn to scale, represents the 14 cubic feet of air which is breathed per hour by each individual. This quantity of air, when returned from the lungs, exhausted of the vital element oxygen, is charged with carbonic acid to such an extent, that it vitiates to a great and poisonous degree 100 cubic feet more of air.

The adjoining sketch, drawn to the same scale as the former, contains 125 cubic feet of space, which is more than is provided for those living in Rose-alley and many other places to which we have from time to time directed attention. The figure A is a man of ordinary size compared with the cubic space provided in the above dwellings; and when we consider that in the St. Pancras dormitory, where 164 cubic feet were allowed to each person, Dr. Jones found that the air contained about thirty times its proper amount of dangerous carbonic acid,—as a matter of course, the air in the dwellings in Rose-alley must be in a dreadful state of adulteration.

The next drawing contains a cubic space of 512 feet, a trifle more than the quantity allowed in the best of the London barracks. Even a cubic space of 500 feet will, according to Dr. Jones's calculation, have nearly ten times the proper amount of carbonic acid. At Portman-street there will be twenty times too much.

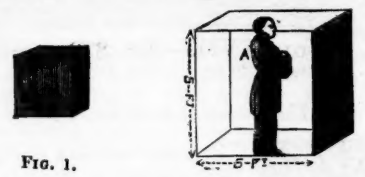
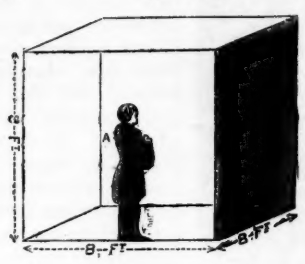
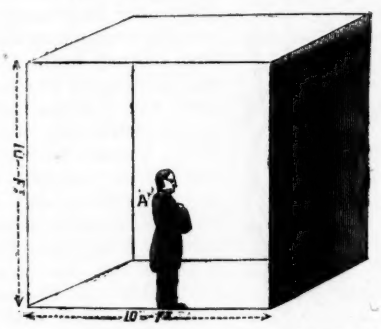


FIG. 1.





The figure corresponds in scale. How, then, can we wonder at the loss of health?

The last engraving shows the proportion which 1,000 cubic feet bears with the above, and is the amount of space allowed in several hospitals. This would contain nearly five times the proper amount of carbonic acid; and even in a space of 2,000 cubic feet for each person there would be an excess of impurity.

Impurity in air and a miserable home involve ill health, degradation, and an early death. These are not trifles, and the subject may not be slighted.

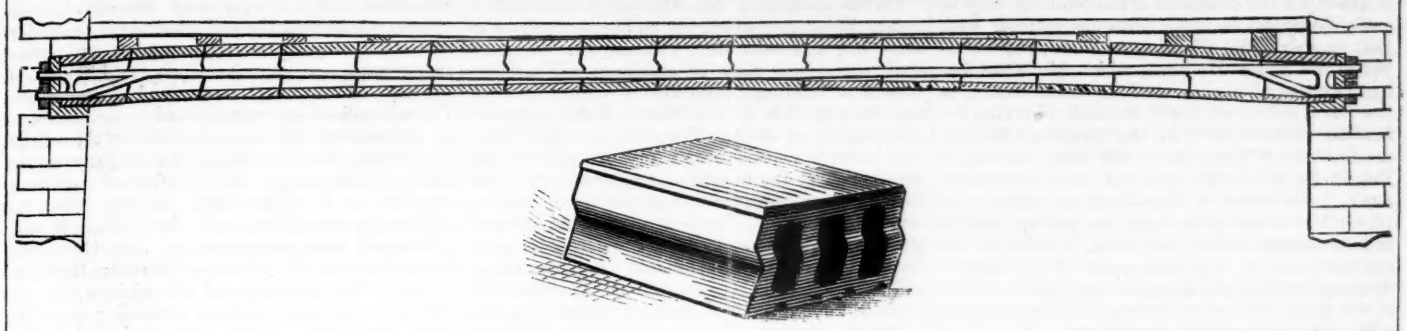
ENGLISH ART AND TASTE.

IT is one of the peculiarities of Englishmen that they are generally ready to overpraise the efforts of others without sufficiently appreciating or taking credit for the good qualities and conditions they possess at home. It is said, and the statement is generally believed, that we are an inartistic, unmusical, and untasteful community, and in consequence often look over the water for the purpose of praising these gifts, which are so valuable in a civilized country, thinking we are sadly deficient in this respect ourselves. If, however, we look at home, and compare our architecture, metal work, ecclesiastical and domestic furniture, made and used by us, from the time of the Saxons to the beginning of the eighteenth century, it will be found that our productions may be contrasted, without damage to us, with the similar works of various parts of the Continent.

The architecture of Westminster Abbey, York Minster, Lincoln, and some other English cathedrals, both for the general beauty of their proportions and for details, are sufficient to put us in a good position in this department of artistic and constructive skill: and the fine works in gold, silver, and other metals, and the richly decorated tissues, &c. of the Middle Ages, may be mentioned as honourable instances of the true spirit of art which existed in this country.

As regards music, the sweet and charming madrigals of Shakspeare's days, and other English compositions, may be well contrasted with other national music of similar date; and, during the darkest age of British art, the appreciation of the famous works of Handel shows that musical feeling was not extinct amongst us. Since that time the increase of the taste for and knowledge of music has been remarkable. Nor has this been confined to the patrons of the operas and the higher classes, but it has spread amongst the middle ranks of our population; and now, in many of our manufacturing districts, numerous bands for the performance of instrumental and other music have been formed by workmen; and lately, at Darlington, between twenty and thirty of these

BUNNETT'S FIRE-PROOF FLOORS AND ROOFS.



bands, consisting of upwards of 250 performers, assembled for the purpose of competition.

In poetry, Shakspeare and Milton,—in philosophy, Lord Bacon and Sir Isaac Newton,—in general literature, Oliver Goldsmith, Dr. Johnson, Daniel De Foe, and Sir Walter Scott,—and in medicine, Jenner, Harvey, John Hunter, &c. are all men who would be a credit to any nation; and, in connection with mathematics and the sciences, naimes might be mentioned which have a world-wode celebrity. As regards navigation and discovery, if the Spaniards and the Dutch have in a f w instances been before us, it is owing to the energies of Englishmen that substantial colonies, strong with all the instincts of civilization and liberal principles, have been founded in distant parts of the earth.

In order to account for the decline of the practice of art in England, it should be considered that, about the time Michelangelo and the other great masters of the Italian schools produced such glorious results, this country was undergoing a troubled ordeal, which, notwithstanding that it has proved a national benefit, was not favourable to the cultivation of the fine arts; and, after that time, continued changes and the rapid increase of commerce and manufactures led the attention of the public to these matters rather than to others of a more refined description. The long war was also a means of checking the improvement of our taste. It was, however, about this time that the English school of painting was commenced by Sir Joshua Reynolds and other worthies, and it is but just to remark that some of the pictures by Reynolds were not equalled by those of any foreign contemporary; and amongst the English painters who have flourished since them the works of Turner and others may be mentioned as evidence that the climate of this country is not unfavourable to the production of paintings of the highest class.

The genius of Flaxman and the ability of the painters and sculptors of the present day should not be overlooked; and, as a further instance of a national love of art, we would refer to the large and valuable collections of treasured efforts of genius in the castles and halls of our nobility, gentry, and merchants.

In landscape engraving on copper and steel plates and engraving on wood we are at the present day unrivalled; and, while admitting that much improvement in the general knowledge of art is necessary, and that vigorous exertions are required to produce with skill and elegance many art manufactures, so far as painting, both in oils and water-colours, is concerned, the present English school is not surpassed in valuable qualities by those of France or Germany; and, when we compare the fine productions of our potteries and glass-works, our calicoes and other ornamental textures with those of a quarter of a century ago, we look with hope for the future, when, as a nation, we may be as distinguished for refined taste as we are now for skilled handiwork and matters of utility.

Besides our marked progress in art, there have been other great objects achieved of which we may be nationally proud.

By means of the steam-engine we have multiplied a thousandfold the strength of man. By the application of this power to our marine the journey from London to New York can be made in as short a time as a journey from the Tweed to the Thames could be managed 150 years ago, and by the same power applied to our iron roads passengers and goods can be passed between these two rivers in less than twelve hours. It was in England that gas (although it is said to be a French invention) was made to supersede candles and oil lamps; while the electric telegraph, which is destined to produce great changes amongst the nations of the earth, has been carried to its present state of perfection in this country.

Did Benjamin Franklin dream of the uses to which the subtle fluid might be put when he succeeded in drawing it by means of the kite string from the thunder-cloud?

BUNNETT'S FIRE-PROOF FLOORS AND ARCHES.

MR. BUNNETT, of Deptford, has patented an arrangement of hollow bricks and tie-rods to form floors and roofs. To speak according to the specification, earthenware or clay blocks, made by expressing clay through moulding orifices or dies, are used in combination with tie-rods and wall-plates, so constructed and arranged that the thrust is brought in each case to act on the tie-rods and the wall-plates, the several blocks being so formed as to over and underlap each other, and mutually to give and receive support from neighbouring blocks. The wall-plates are by preference made of angle iron, and they are tied together by the tie-rods at suitable intervals; and it is preferred that the tie-rods should pass through the blocks of clay or earthenware, such blocks being made hollow with that view, as well as to obtain lightness. We give a diagram of one of the arches. Although the form of blocks used may, to some extent, be varied, it is preferred to form them in the following manner: the interior is made hollow from end to end by the aid of a suitable core or centre die. The two sides are each composed of *two parallel inclines*, each about half the depth of the block, connected by a horizontal, or nearly horizontal plane, and the two inclines on the one side are parallel with those on the opposite side. The annexed engraving will better explain it. In cutting off the clay at the ends of the blocks, the cutter produces the ends of a form corresponding with the two sides, though this is not essential, so long as the ends of the blocks are made to fit into each other, and give to, as well as receive, support from the next blocks.

Mr. Bunnett has erected on his premises an experimental arch, 21 feet span, with a rise of about 2¾ inches (the thickness of the bricks 6 inches), about 13 feet wide; and has also constructed other arches, for the purpose of testing its bearing powers. One of the latter, 15 feet between the bearing-walls, and 2 feet 3 inches wide, has been loaded with 4 tons 10 lbs. (or 267 lbs. to the square foot), and is quite elastic. The deflection is about 9-16ths of an inch. The bricks are put together with Portland cement and sand. Each brick is 10⅜ in. long, by 9⅜ in. wide, and 6 inches thick; and weighs 21 lbs. 100 square feet comprise—

	Ton.	Cwt.	Qrs.	Lbs.
145 bricks, weighing	1	7	0	21
Cement and sand.....	0	2	3	19
Angle iron and tension bars (bars being 4 feet apart)	0	2	2	5
So that the total weight per Square is	1	2	6	17

THE WELLINGTON COLLEGE.

THE buildings forming the Wellington College, of which, as designed, we gave some particulars and illustrations in our volume for 1856, have now been completed, with the exception of the infirmary, chapel, bath, laundry, and some other and minor accessories on the ground level, external to the principal group; and it has been announced that the ceremony of opening by the Queen, when a large number of troops will be present, will take place on Saturday, the 29th inst. The masters' rooms, class-rooms, and offices are already occupied or furnished; and the first batch of 80 students were to arrive on Thursday last. No exertion or expense, whether as to the suitableness of the edifice and fittings, or decorative character, appears to have been spared, to render the whole an efficient institution, and a monument of the illustrious individual commemorated; and considering the public interest, and we may add the importance architecturally of the subject, our readers will be glad to have a particular account of the work, derived from an inspection made within the present week.

It may be well to premise, by way of reminder, that the college is the result of voluntary subscriptions by the British public in all parts of the world, towards the object of a fitting monument of the late Duke of Wellington. Subscriptions, and interest on the sums invested, together with 25,000*l.* from the Patriotic Fund, and 3,000*l.* from Sir J. Bailey, M.P. amounted to nearly 159,000*l.* In the application of this sum, 105,000*l.* were invested on mortgage at 4*l.* per cent. giving the college towards maintenance, 4,200*l.* per annum. The twelve acres of ground on which the buildings stand, having been presented by Mr. Milner Gibson, the cost of a further quantity, amounting to 120 acres, was 1,200*l.* Therefore, the amount available for the building appears to have been 52,800*l.* The tenders received in the middle of 1855, ranged from 45,710*l.* to 36,175*l.*; for which last amount the contract was completed, including the laundry about to be commenced, and the iron bedsteads for 100 boys, and other furniture; but exclusive of the greater number of the bricks supplied by the Governors, and made on the ground, which would have raised the amount to about 40,000*l.* still, however, exclusive of the warming and ventilating arrangements, the water-supply, and the gas works, and formation of the roads and grounds. The outlay eventually, including the chapel and infirmary, and land, may amount to 55,000*l.*

The college is designed for the education of 246 boys, orphans, sons of officers of the army and navy, the Indian army included. Those on the foundation will be divided into three classes, paying from 10*l.* to 20*l.* a-year, each boy. A fourth class of boys not on the foundation, will admit sons of living officers, who will pay 40*l.* a-year each. The amounts will cover expenses of board and washing, education and books, medical attendance, and two suits of clothes a-year, for each boy. The fourth class is merely temporarily constituted, or pending increase in the funds—in the event of which all boys will be placed on the foundation. The instruction, besides the classics and the modern languages, is to include "those branches of scientific knowledge which have a special application to the arts, commerce, and industry of the country." In the religious teaching, regard will be shown to those who have conscientious objections to the doctrine of the Church of England. The college will start with an entire income, or, including the payments by the first hundred boys, of 6,070*l.*

The site of the college is in the south-east angle of Berkshire, where the county joins Hampshire and Surrey, near to Sandhurst, and two to three miles in direct line north of the Sandhurst Military College, and the station at Blackwater, on the Reading and Reigate line of railway. It is about half a mile to the east of the railway, with which a tramway for conveyance of materials was connected. The land is elevated heath-ground, with extensive views towards Bagshot-heath on one side, and over the Hartford-bridge Flats on the other. Wokingham is some four miles north, and beyond it Windsor is seen. The view over Hampshire, it is said, extends to Strathfieldsaye, the seat of the late Duke. The building is flanked by two lofty towers, or one to each of the two principal blocks of building, which have themselves a considerable effect of mass and altitude as seen from the

country round, except on the side of the Military College where hills intervene.

The style and character of the building may be easily described to those who are familiar with that manner of Sir Christopher Wren, best exemplified in Chelsea Hospital, which Mr. Shaw has had in his mind in several of his recent works, as the Naval School at Deptford, and who also are familiar with the work at the corner of Threadneedle-street,* belonging to the same school—of French-Italian design, and red brick and stone-work, with traces of the Jacobean manner (to which Mr. Shaw gave attention perhaps earlier in his executed works), and which building is remarkable also for picturesqueness of its window-dressings where the materials are used, as also in the coins, in alternate courses; for its curb-roof with dormers; and for its chimneys rising from the eaves. The arched gateways (we might add even the wooden gates) of the Wren school, of which inferior examples may be found about the halls of the City Companies; the effective grouping of one-storied with loftier buildings, and having the characteristic very prominent roofs with dormers, as at Chelsea; the mezzanine story as a feature in the exterior; the Italian louvres to roofs of halls and porticos, founded on the model of such as are at Chelsea and Lambeth Palace; the circular or oval openings introduced, sometimes with richly-carved festoons in stone, or scroll-buttress work in the case of the dormers, in wood; the stone or gilt balls, and pine-cones, surmounting piers, or points of roofs; and the elaborate iron-work in balconies and fan-lights, and as cresting to the roofs, may be observed in both cases. The result, therefore, is an appearance of imitation of manner, at the same time that there is development and continuance of the idea in many of the details, as well as richness in comparison with buildings like Chelsea Hospital, not to mention invention in a certain portion of the details, and so much technical skill throughout, that we hesitate in classing the Wellington College with imitations of the character to which we have been lately accustomed,—though it may be convenient to us to refer to the works of Wren for present purposes of description,—and even though, as we have sometimes said, architectural art of the highest class must be such as has its excellence compounded with the fact that it does not so easily fall within the scope of mere verbal description.

The manner of Wren, though we have chosen to call it French-Italian, differs somewhat from the analagous French style, as it does from the more markedly Italian, coëval with it, and used by the architects of the two countries in their more important, or entirely stone-constructed buildings. The red-brick-and-stone architecture of Wren's school has a very Dutch appearance,—manifest in Hampton Court, even without reference to the Dutch style of gardening,—a character which it is reasonable to suppose may have arisen from the intimate connection with Holland, during the reign of William III. and from the tastes of that monarch and his court. A certain impress of the Jacobean style, itself originally owing much to the same continental locality, lends itself therefore not inharmoniously to the various other elements.

The William III. style may be said to have prevailed to a period within our recollection. The best of the houses of London, of the last century, are distinctly marked with it, in the piers or "coins" at the angles, and in the prominent curb-roof. Sometimes at the outskirts of London, the flat-topped roof, with railing as cresting; a symmetrical arrangement of the windows; a defined centre, and a bold flight of steps to the door, make up a whole of which the effect with the surrounding features of garden, trees, or landscape, is satisfactory in spite of clumsiness in some details,—and an effect which is certainly, as effect ought to be, largely in the inverse direction to the quantity of the ornament, or as contrasted with effect given by the elaborate shams satisfactory to, and even desired by, the public, in still the majority of works of our day. The claims, therefore, of the style, are respectable; and Mr. Shaw has, it is to be admitted, shown of what it is capable, as well in town-architecture as in the country, and in distant effect. The advantage, however, as in the case of mezzanines, of very small windows adopted from considerations of mere effect, and of rooms in the roof for dormitories, we cannot approve of. The architect of the Wellington College has doubtless well considered the point; as to the latter matter finds some advantages in the arrangement; and will have constructed the roof-covering with a view to limit any results from changes of temperature.

On the question of the relations of convenience and architectural effect, the public are subject to some hot and cold fits. One day you may read that the whole class of architects will sacrifice uses of a building to notions of effect; another day, that there is no architect in Britain capable of achieving an effect. The architect of the work now under our notice seems to have secured the *vox populi*, or the approval of some of those who anticipate or claim to express the voice; and we may be glad of it. There are, however, curious questions, many more than we can now enter upon involved in the merits of this recent building, and the opinions it is calling forth. One question is, how far, in the best living architecture, convenience or mere effect should either of them interfere with the other? or, on the opposite hand, whether, were the real feelings of men tested or brought to conclusions, it might be found that *some* sacrifice even of convenience would be, and is always, readily accepted for the sake of that—the beautiful—which is equally a necessary in man's existence?

But we are interrupting the particular account of the Wellington College architecturally and structurally in its plan and details, which the buildings claim. The view in our volume for 1856, though representing correctly details which have been adhered to in the executed work, showed only one front—the north, or rather north-east—of the building as designed, and omitted the present towers; whilst the ground plan, though still equally accurate—with exception before mentioned, of parts not yet commenced—being only the ground-story, might give, without description, an erroneous idea of the general arrangements and executed design. Therefore, it should be understood that the group consists of two parallel main buildings, the intervening space occupied by three transverse blocks, and two cloistered courts or quadrangles, the whole filling an area of 257 feet 4 inches by 154 feet 3 inches clear of the thickness of the walls, besides which there are one-story buildings, and yards and gardens enclosed by walls, extending from the sides of the main group, and increasing the dimension, as last named, or transversely to the principal portion of the plan, to about 338 feet. The hall-quadrangle—south-west—measures in the covered space 69 feet, by 88 feet transversely to the general buildings; and the school quadrangle, similarly and in the corresponding position, measures 77 feet by 88 feet. The transverse blocks bounding the courts, are considerably less in height than the main blocks, to which, moreover, they do not join in actual effect, a small space at each end of them being of only one story—an arrangement also not unworthy of notice as regards circulation of air. It is clearly indicated in our view before mentioned, where the ends of the main buildings are shown, as well as the north-eastern filling-in block, which last, being appropriated to the masters' residences, has two stories with similar windows, or much resembling those of the building in Threadneedle-street, besides the dormers in the roof. The other transverse buildings—the dining-hall, south-west, 74 feet by 28 feet, and the large school-room in the middle, 88 feet with the recesses, by 28 feet, have no floor above the ground-floor, and are consequently lower than the building of the residences, though they have a range of upper windows, oval, as well as dormers in the roof. The school-quadrangle is cloistered on its four sides; and the hall-quadrangle on three of its sides. The cloisters are 6 feet in the clear width, and 9 feet to the springing of the arches. Each cloister running lengthwise with the main buildings, like that transversely, attached to the residence, is part of those buildings, and has a mezzanine over it. The cloister on the school-quadrangle side of the school-building, and that along the dining-hall, project, or have no story over. The quadrangles are highly effective, as will shortly be described. The cloister and mezzanine taken together, of course correspond in height (20 feet to the floor-line above) with the rooms of the principal ground story; but those rooms, or which are on the outer sides of the main blocks mentioned, have an upper range of square windows like those of the mezzanine proper. The one-pair story in each of the blocks is a range of dormitories (14 feet from floor-line to floor-line), divided only by staircases, and the rooms of the chamber-men, intermediately in the length. A similar range (12 feet in the clear height) is within the roof; a portion of the space, however, in one case, is being fitted as a temporary chapel.

The ground story arrangement is almost identical with that shown in our plan: that is to say, in the main buildings there are four class-rooms (29 feet by 21 feet, and 19 feet in height), a boys' play-room and a library next the school quadrangle; whilst next the hall-quadrangle are under-masters' library, common room, stores, and nurses' apartments, and opposite them the kitchen and scullery, servants' hall, larder, and kitchen stores. The mezzanines are appropriated to various rooms for the masters, officers, and servants of the college. The dormitories are formed into compartments of 10 feet 6 inches by 7 feet, by framed partitions, reaching to a height some distance below the ceiling, the remaining space being filled in with galvanized iron wire-work, so that there is a passage-way of 10 feet down the centre from end to end. The infirmary and chapel intended, are shown in our plan as wings advancing from the south-west front. They will be joined to the main building by corridors. The opposite front (shown in our view) is now somewhat extended by the low buildings for the kitchens and offices of the secretary's and head-master's house. An archway in the centre of each flank of this north-east front leads into a garden attached to the residence; the spaces south-west corresponding with the secretary's and head-master's gardens, and, like them external to the main blocks and enclosed by walls, will be appropriated as under-master's garden, and kitchen-garden, excepting that within the area of the quadrangle last referred to, space will be afforded for the laundry. Separating the gardens, or on the transverse axis of the plan, and therefore in line with the large school-room and with the staircases to the dormitories, there will be, on the north-west side, a low building for a large bath, whilst there are on the opposite side coal-sheds, and other buildings planned as a boiler and engine house. Close to the staircases on each side, in the same line, are the several conveniences. These are arranged—at least the more important of them—and very questionably, not as closets, or with the appliances thereof, but with the trough below the seats, for periodical flushing, as adopted in many industrial schools and workhouses. There are closets nearer the dormitories for night-use. The outfall of the drainage is into large cesspools, two in number, at a short distance from the building, of brickwork in cement, and measuring perhaps 12 feet in diameter and 10 feet in the clear height. These latter arrangements we are disposed to regard as only temporary, or preliminary to the best system for utilization—for which the situation of the building should offer advantages.

The towers, somewhat varied from the original design, project 8 feet from the sides, or longer fronts—being carried up over the space occupied by the staircases, and by the heating and ventilating apparatus at present in the basement, and containing water-tanks, and angle-flues in which gas is kept burning, to induce the extracting current of the system of ventilation. The ventilating arrangements were entrusted to Messrs. Haden, of Trowbridge, and involve the extraction as well as the admission of the air in the lower part of each dormitory and room. The water-supply has been carried into effect by Messrs. Easton and Amos. The supply is derived from wells sunk near the site of the building; and the water is pumped into the tanks in the towers. We may add that gas-works also have been provided at a short distance from the main buildings. They occupy an area 56 feet square, and were entrusted to Mr. G. Walcott.

The towers are 96 feet in height to the top of the gilt pine-cone—the conductor, however, being some feet in addition. They are covered with bold domical roofs, square on plan, having the curves of contrary flexure (the apron-roll, and angles boldly marked), and having dormers or lucarne windows at the sides,—the termination to each roof being a small arched and dome-capped finial, carrying the pine-cone. The angles of the square part of the tower are terminated by tall shafts for the ventilating flues. From the ground to the top of the cornice is 70 feet. The towers correspond in the lower part with the general flank elevations; and the same character as to forms and details of the windows is observed in the space above the level of the cornice of the main buildings.

The flank elevations themselves are very plain as to the windows of the ground story, and the square windows corresponding with the mezzanine, since the lower part of those flanks is nearly concealed by the walls of the gardens, or outer quadrangles, and buildings connected with them; though the square windows have architraves of moulded brickwork; but the upper windows lighting the principal floor of dormitories are of the decorated and peculiar character before adverted to. An ornamental string-course and a

* See the view in our volume for 1855, p. 103.

modillion cornice, the latter in Atkinson's cement—as are some of the ornaments under the window sills; and circular panels in the brickwork with medallions in stone carved with the letter W, are the other features of the front. The lofty chimney shafts, with alternating brick-and-stone coined angles and stone cornices, carried up from the eaves at nearly every one of the piers; the prominent roof already spoken of with apron-rolls and mouldings, and gilt balls at the hipped ends, the large dormer windows with pediments, and the weatherings of the cornice with imitative lead-rolls, combine to produce a certain richness, and which reaches to greater elaborateness in the south-west front. The hip-rolls of the roofs are in all cases terminated by scroll-work, or other ornament executed in the lead; and we may observe that throughout the exterior, as in the design and execution of the ornament in stone and wood, the effect at least is well calculated for in regard to distance from the eye. It is observation of such points no less than the structural details, which has induced us to speak favourably of the technical skill noticeable throughout this work. The construction of the chimneys is believed to have been attended with unusual success, as regards the absence of smokiness. The general roofing is slate; the dormers being of wood, are covered with lead. The windows are all filled with sashes, in which the character of the style is still preserved. An ornamental bracket is carved on to the centre of the bottom of rail of the top sash.

We should, for the realization of the effect of the building in the reader's mind, have stated earlier that the bricks are of two kinds and different colours. The general brickwork is executed with the bricks made on the ground, which are of a purply-red colour; whilst, for many of the features of decorative effect, the Reading bricks are used—these of an orange red.

The brickwork is set with blue-ash mortar, and is executed with remarkable precision, and there is no crack or settlement observable. The horizontal joints were "drawn" differently to the usual practice—or with a view to prevent lodgement of wet. The walls generally are two and a half bricks thick. The stone is Bath, we believe from the Corsham Down quarries.

The chromatic character of the building is, in truth, one of its chief sources of effect. Such character is marked, as it is pleasing, in the two principal quadrangles. The cloisters here are formed by piers, 14 inches in the face and 1 foot 10½ inches in the thickness, carrying segmental arches, and built, as well as the arches, in brick and stone, alternating in the dimension of 1 foot, or four courses. On the middle of the centre voussoir, or "key-stone," a console is carved: it is finished by volutes at the top, forming part of a continuous label to the range of arches. The treatment otherwise of the dormitory buildings is the same as described for the external fronts. The principal windows of the hall and school are similar to those of the dormitories; but variety results from the introduction over them (or over the corridors, on one side, which project in each case) of the oval windows, and by the small dormers, with their carved scroll buttresses and curved pediment of each dormer with shell in the tympanum. In the school-quadrangle, also, the entrance to the school is marked, as is the principal gateway opposite to it, by an arch under a frontispiece of columns with an entablature and pediment, similar in general character to that in our view, but differing in ornamental accessories. The frieze over the school entrance bears the motto, "Virtutis Fortuna Comes," between lions' heads; and in the tympanum in a coronetted shield, or wreath, is the monogram A. W. Underneath, over the school door, will be placed the bust of the duke. The piers of the corridor in this side have stone balls as finials. Along the sides of the corridors or cloisters throughout, are circular recesses, with brackets, ready for busts of military heroes. The royal arms appear in other cases, and various shields and like ornamental features are introduced in the towers, as in other parts of the building.

The south, or south-west front, differs from the other, the north or north-east, chiefly as regards the intermediate transverse building, which as we have said is the dining-hall. The ends of the dormitory buildings differ slightly from one another,—that is the south-west from the north-east. They have windows like those to the dormitories, of the flanks, in the ground story, and square panels, corresponding with the mezzanine windows, to be filled with inscriptions; but the ends south-west, have each a central doorway with pilasters, entablature, and a scroll pediment, and the window openings are filled in with ornamental iron-work. In the one-pair story, in either case, there are shell-headed niches with architraves and cornices, medallions over them, and an elliptical arch-headed window in the centre, filled in for the glass with ornamental iron-work, and having a balcony with a very elaborate railing. The iron-work, including that to fan-lights, was cast by Barrett, of Tottenham Court-road, to whom it does credit. The hipped ends of the roofs have oval lucarnes as well as dormers.

In the transverse building (south-west front) the upper range of oval windows, but with rich carving, is again found, as well as the dormers; but much of the character is comprised in the centre portion, the roof of which, with the pediment, rises higher than the main roof, and is surmounted by the louvre turret, which is made an excellent feature here as well as internally, and is very different to the turret at the opposite end of the building—suitable in design to its own purpose of a clock-turret. Below the pediment and entablature of the centre is an arch, enclosing a circular window above one of the lower range the whole well grouped, and richly ornamented.

The hall and school derive their decorative character internally, chiefly from the open roofs, where the trusses are somewhat of Jacobean style, with ball-pendants. The rafters are boarded over; and the woodwork is all grained a light tint. The walls show the brickwork, but are painted or coloured—painted, at least, on the lower part, and of a warm and rich tone of colour. The tables and benches in the dining-hall, designed to accord in character with the building, and of oak, are worthy of notice. The dinner is passed into the hall, through apertures at the end, from a lobby, where the beer-engine is fixed. The recesses at the ends of the school-room, which make up its greater length, are arched over, and the principal masters will have here their desks. In the kitchen, as we should say, the grate for roasting is small as compared with the provision for boiling and stewing. Have we here another of the effects of military "routine?"

Had not this notice already extended to considerable length, we should add some further particulars of interest connected with the structure, gathered from the building and from the carefully drawn specification. We can at present only single out for remark the Portland cement flooring used in the quadrangles, and generally throughout the building, as a superior specimen of work: but, indeed, the whole of the works reflect high credit upon the general contractors, Messrs. Hollands and Hannen, and those associated with them, and also upon the architect's clerk of the works, Mr. William Lyne, acting under Mr. Shaw's directions. The works of the Wellington College were commenced in January, 1856, and the foundation-stone was laid by the Queen in June following. Much has still to be done in laying out the grounds, and in the formation of the lake of twenty acres, and these accessories will add much even to the architecture.

ON THE PAINTING OF THE ANCIENTS.*

I FEEL, as an architect, that, in bringing before an architectural society the subject of colour, which, however graceful, must be considered the least important branch of architecture, rather than the graver considerations of form, proportion, composition, &c. I owe some apology; but, as a lover of the picturesque, and having in my travels given some attention to painting in its various branches, I venture to offer you some remarks upon this highly attractive branch of our art.

Though colour is not in all cases indispensable to architectural effect, yet its value cannot be doubted as affecting architecture in general, and the true understanding of its application is hardly less difficult than that of the more serious branches of the art.

Yet it must be remembered that the great masters of architecture whose works are our text-books,—Alberti, Vignola, Palladio, Phillibert de l'Orme, &c.—have treated it as a comparatively secondary art, in a measure separated from the more grave consideration, and leaving it to the painter and the decorator.

Vitruvius speaks of it at considerable length (7th book, cap. v. to xiii.), but it is in reference to interior and not at all to exterior decoration. This distinction is of the greatest importance to mark in considering the application of colour, for upon it the chief merit of the question may be said to turn.

The use of colour in interiors has been adopted in all times and countries, and the reasonableness of the practice cannot be doubted; but, in the best times of art in northern countries, its use in exteriors has been rejected in a great measure.

The consideration of the subject of polychromy is of comparatively recent date: it is now the fashion of the day, and let us beware how we abuse it, or attempt to hide by ornament the want of art, subverting the practice of our forefathers, and attempting pedantically to introduce into our own practice that of countries whose conditions are entirely different from our own.

Therefore, in treating the subject of ancient polychromy, I do not mean to advocate its adoption in this country, but rather by considering the works of the ancients, those great masters of common sense, to endeavour to follow their reasoning, which is so admirably adapted to their conditions and climate, to draw some conclusions with reference to our own.

All good art may be said to be a translation more or less direct of the book of nature, and there is no chapter in that book so largely treated, or so imperatively forced upon our consideration, as that of colour. Nature is lavish of colour in all her works, and delights the eye with her harmonies in all her operations: from the golden glories of the rising or setting sun to the pencillings upon the back of the tiniest beetle, all is harmonious and all variety.

The whole face of nature speaks to the lover of the beautiful by colour in the earth, in vegetation, in animal creation, and in the endless variation of accidental colour, in sunlight or in clouds.

Even the unseen depths of the ocean are full of objects exquisite in colour—seaweeds, shells, and the glorious rainbow hues of fishes.

And the various objects of creation have further varieties in their own species. In man how various are the combinations of colour: the dark hair and olive complexion, the blonde hair, blue eye, and ruddy skin, the rich auburn and the golden red; and the true artist will surely set aside the conventional contempt of dark skin, and will find in the negro and the Indian, subtleties of colour hardly inferior to our own.

So lavish is Nature in her distribution of colour, that she does not confine it to her own works, but even to the conventional works of man, she imparts by a few years of exposure to her influences of atmosphere and climate, a complexion whose harmony no art can approach.

From the poles to the tropics all is colour, but as Nature has varied the conditions of climate and situation, so she has graduated her distribution of colour.

In the poles, amid eternal snow, and under a pale sky, Nature has made all her objects pale or white: there is no brilliant vegetation: birds and animals are all grey and white, and offer but little contrast to the surrounding scene. As we advance towards temperate climates, we find bright vegetation, and a greater variety, and deeper colour in animal creation. In those countries where the sky is always blue, there is a further increase of colour, until finally in the tropics we find gorgeous flowers and brilliant birds, and great jewelled butterflies, dazzling to the northern eye. But however opposite are the combinations of colour in the poles, or in the tropics, the result is the same—harmony.

And this harmony, established by Nature in each latitude, affects the eye of the inhabitants, and the result shows itself in their habits, and in their choice of colour in dress, and in all objects of every-day life.

When an untravelled person sees a case of South American birds, or hears a description of the gorgeous colouring of the jungle swamps, he imagines that such contrasts of colour cannot be otherwise than discordant; but the sober greens and greys of the north, his model of harmony, would appear tame and colourless under a southern sun.

Every one who sees with a painter's eye will have observed that the relative value of contrasting colours under a grey or neutral light, and under a brilliant sun, are absolutely changed; and that contrast which, upon a cloudy day, would appear harsh and discordant, is subdued and harmonized by the rays of the sun.

Besides, sunlight introduces a new element into colour, namely, light and shade, with its endless variety, from the cold-cast shadow lighted by the blue sky, to the warm reflection from a lighted surface; so that local colour loses a portion of its importance, and contrasts become less violent.

* Read by Mr. Frederick P. Cockerell, at the Architectural Museum, on Wednesday evening, the 19th instant. Mr. Beresford Hope, M.P. presided.

This is a consideration of the greatest importance in judging of the system of colour adopted in those countries where polychromy took its rise and reached its maturity, and which are now more particularly under our consideration.

Besides, in those countries the blue sky, the varied hues of the mountains, the sea, &c. form a background so brilliant that, unrelieved with harmonious colour, white in architecture would be ghostlike and crude.

Having, then, prefaced with these considerations, and recognised Nature as our mistress and the source and fountain of all our inspirations, following her by analogy and not by direct imitation, let us proceed to consider the works of the ancients, and compare them as best we can with Nature.

It is not our province here to attempt to deduce from her countless varieties any system, or to establish any rules, to reduce the infinite within the compass of the finite. This has been frequently and most ingeniously attempted by different authors, but the result has been necessarily insufficient, and such, that the first natural object that came to hand would furnish an exception to the rules laid down.

The prism is a measure that lays open to us Nature's system of colour; but it is in itself a disquisition so profound that we can add nothing to it, nor can we vary it so as to suit our various requirements. Without stultifying its harmony, we must therefore humbly accept it as it is, acknowledging that we are incapable of appreciating all that it teaches, and that to imitate what we do appreciate is infinitely beyond our limited means of execution. A satisfactory theory, therefore, is a thing unattainable; let us not, therefore, attempt to lay one down, but let us reverentially turn to the works of the great fathers of art, and endeavour, by following their progress from the earliest times, to discover, first, whether their works do agree with our hypothesis; and if so, what may have been their interpretation of Nature's teaching.

We cannot pretend positively to follow the reasonings of the ancients, or to look with their eyes into the book of nature. It is possible that we may imagine analogies with nature, where none were intended; but if such analogies can reasonably be instituted, it is some proof of the correctness of the principle contained in the work of art (and if the work be good, *vice versâ*). I would, therefore, only suggest in following the development of art, such points as appear to agree with our hypothesis.

The earliest style of pictorial decoration known to us is that of the Egyptians. We shall, no doubt, find in their works a certain following of nature; but the analogy with her goes no further than that first principle which dictates that there shall be colour in everything. The mode of producing this colour is for the most part by copying of natural objects, as birds, beasts, serpents, &c.; or heroic or domestic subjects. No doubt these early paintings (to the repetition of which tradition bound the Egyptians of even the later times) were the nearest approach within their limited means to a direct imitation of those objects. And though we must not lose sight of the fact, that these objects were naturally chosen as entering into their religion, the comparative scarcity of conventional ornament, or the absence of a regular system of lines adapted to architectural forms, seems to show a rudimentary state of art.

Those ornaments which are conventionalized are still closely imitated from nature, as the lotus cap, the papyrus, the palm, &c. And though this cannot be considered otherwise than a merit, I point to it only in contradistinction to the refined conventionality of the Greeks.

The colours used are glaring, and in crude contrast, without gradation or harmony. The modesty of nature is lost sight of, and her principle of universal colour interpreted by the use of universal paint.

I pass over thus briefly the Egyptian period, because, although the art of the great times had its origin in the teaching of Egypt, there is very little in itself that shows a high artistic cultivation, or that can serve as an example for us. The striking quality of the monuments of Egypt, of another, and indeed of a higher order, namely, simplicity and greatness of material and of execution, which convey such a sense of the mechanical power of the people who produced them.

The next period of art, namely, the Greek, may be said to embrace, if not the birth, at least the first forward step, the progress and perfection, the decline and extinction, of classical taste.

It is in the Greek works that we find the first germs of that taste which reached its culminating point in the age of Pericles; and the art of the Romans, however debased, is still formed upon the Greek traditions, which were handed down till the deluge of barbarism swept away what little of good remained, and sowed the seeds of another style, which, faithfully following nature, as the Greeks had done before, ran a course not less glorious than them.

We have mention in history of periods of whose art no vestiges remain. Traditions, repeated by Diodorus and other authors, speak of the works of the first Dædalus (for three are mentioned at various times). Some antiquaries have endeavoured to give a reality to this mythic father of Greek art, and have supposed him to be a contemporary of Theseus, and placed his existence in the fourteenth century before our era. Probably he is simply an ideal impersonation of art, as Theseus no doubt may be of the heroic character. But this is mere curious antiquarian speculation, and has no bearing upon the history of art.

Of the earliest Greek works known to us, perhaps the most important are the temples of Selinuntum, in the south of Sicily. This great and flourishing Greek colony was founded about the year 650 before our era, and was destroyed in 409 B.C. There are seven temples remaining, and the best authorities consider that the first and the last of them are about parallel with the commencement and end of its existence.

I cannot speak positively of any remains of colour in the architecture of the earliest of them, but there can be no doubt that there was colour, from the fact that the metopes are painted.

There are very distinct remains of colour in the other temples. The duke of Serradifalco, in his work upon the temples of Selinuntum, says,—

"The excavations carried out in the temple E, and the œdicule B of the Acropolis [see his work, plate 2] gave new and more evident testimony of this sort of ornament. There remain of the first many trunks of columns coated with the finest white plaster, and one of them still retains three horizontal zones, each of which is successively painted with red, white, and blue. The listel of the architrave is red, that of the guttæ blue. The triglyphs painted blue upon the face, with black channels. The astragal (?) of the capitals red; and to the posticum of this temple belong certain mouldings in terra cotta of a yellowish colour, with frets and other ornaments painted in red and dark grey. From various fragments we learn that, as in the Parthenon, the ground of the metopes is blue; and upon the arm of the female figure [plate 32 of the work] one discovers some traces of red, which colour, as well as blue, is much more clearly discoverable in a fragment of drapery found in the posticum of this temple. Nor should we here omit to mention the very singular circumstance that we find the cap of one of the triglyphs first painted red upon the stone, afterwards coated with stucco, and at last repainted with the same colour. We have more important remains of the œdicule B, namely, the trabeation of the south-west angle, one of the lions' heads of the cymatium, in which there remains still the sinking prepared to receive it; one angle and various fragments of the pediment; the whole cap of the ante; the lower portion of the shaft of a fluted column, with part of its Doric cap, and several fragments of minor importance. From the observations made upon these remains, we find that the whole fabric was coated with a very fine stucco, of a pale yellowish colour, the listels of the architrave, of the bed mold, of the corona, and of the mutules; these last blue with white guttæ, blue also are the triglyphs and their fascia, which is divided into two by a very fine line. The capital and what remains of the ante are of a yellowish tint, and all the sunk lines are marked with a fine black line, so as to give more effect to the other mouldings."

M. Hittorff, a received authority upon the antiquities of Sicily, and author of the ingenious work "L'Architecture Polychrome chez les Grecs," goes much further, and launches very far into the ideal. Indeed, he does not pretend to confine himself to the facts found in the ruins of this temple, but unites fragments and authorities from other temples in Sicily and elsewhere, to produce his ideal of the Greek system of Polychromy. Perhaps his enthusiasm may have carried him somewhat beyond the bounds of probability in his opinions. A reference to his work, and to that of Serradifalco, will enable those who are interested to judge how far his opinions are borne out by reason and by facts.

The Temple of Jupiter, in the island of Egina, supposed to be about forty years earlier than the last of the temples of Selinus, which in architectural proportion and refinement, is a step in advance of those of Selinuntum, still shows very clear traces of colour.

The best authorities have established that the triglyphs were painted blue, the tœnia red, the mutules blue; their fillet and the rest of the soffit of coronæ red; the cymatium enriched with a honeysuckle in gold; several mouldings, and the soffit of portico painted, &c. There is no evidence, nor do the best authorities conjecture that the broad surface, the shaft and caps of columns, or the wall of cella were painted.

The large patches of blue presented by the triglyphs, appear crude and unhappy, and little in accordance with the refined taste of the artists of Egina, but we find an explanation of this in Vitruvius, where he tells us that in the early wooden constructions, the ends of the beams (the triglyphs), were covered with a board, painted with blue wax, to preserve it from the action of the weather; and as we find in other temples where there are traces of colour, that the triglyphs were likewise blue, it is clear that this ancient practice was carried into later times, as a tradition which popular prejudice and a religious reverence for antiquity insisted upon preserving. In the sculptured parts there are undoubted evidences of colour. The shields and crests of the warriors were painted red, parts of their arms and armour gilt, while the tympanum of the pediment was blue.

The frieze of the mausoleum of Halicarnassus, though of a date about 180 years later, is treated in the same way; and the last discoveries show that the lions' mouths were picked out with red.

No one can doubt the value, and, indeed, the necessity, of such a distribution of brilliant colour to give relief and interest to the otherwise monotonous blaze of white, standing out in strong relief against the deep blue sky, and having no interest of colour to bring into harmony with the brilliant scenery.

But at this period in the progress of art, the refinement of study being directed to the perfecting of form, we may fairly suppose that where so much love and study as were required to produce the Egina marbles had been expended, the result would be considered of higher importance than colour, which, from being so constantly repeated, could scarcely have ranked with the other branches of architecture, and must have been treated as a matter of mere traditional practice, as was, no doubt, the case in the painting and sculpture of Egypt.

It is important to observe that in the cases of Egina and Halicarnassus the colours are made entirely subservient to the sculpture, and so distributed as to assist materially in giving relief to its forms. There is no painted detail (in the sculpture), no ornament or variety of colour to arrest and give occupation to the eye. It is the inferior and less interesting portions which are coloured, and that with uniform tints, producing that sparkle which is so essential to pictorial effect, and leaving the nobler portions—the human form divine, untouched, and, indeed, assisting and giving expression to them by contrast.

And here it is desirable to observe that some picking out is more an optical necessity under a southern sun than we can imagine in our tame light. Those who have studied in those countries will have found over and over again a difficulty in distinguishing forms upon a background of the same colour, from the violent contrast of intense blazing light and black sparkling shadows, which dazzles the eye, and causes the half tints to disappear.

In the tangled intricacy of the frieze of Halicarnassus, being, as it was, at a considerable distance from the eye, this would be particularly the case.

In this principle of aiding form by colour, we may find an analogy with Nature in most of her works. For instance, in flowers the sinking of the calix is marked by getting darker or lighter, and the forms of shells are constantly marked in the same way. The eye-brow seems to have no other purpose than to give expression to the form of the brow, &c.

But in our own conventional works of architecture, Nature's working in this respect teaches a lesson in the plainest terms, and in no parable. Soffits take a rich warm tint, and upper surfaces of salient parts a cold and pale grey, which comes out in strong relief against the varied tints of the vertical surfaces.

This assumption, that as art progressed colour became considered second in importance to form, and so was less used, is in a measure born out by the experience of other schools; and though it would be a bold theory to advance that perfection

of form and perfection of colour cannot coexist in a work, still we find, practically, that they do not, except in rare instances. This is exemplified in many instances in painting, and particularly in the works of the Venetian school. There can be no doubt that in sculpture strong colour detracts from the value of form in the portions so coloured.

Who can walk through a sculpture gallery without being struck with the apparent want of modelling in works executed in coloured marbles or in porphyry?

Many instances of this fact will be familiar to those who are acquainted with our own and foreign galleries.

We always find in well-ordered museums that by the side of a gem, whether intaglio or cameo, there is a cast in plaster, without which it is extremely difficult to distinguish the beauty of execution.

This subject may be further illustrated by the converse as exhibited in the works of the school of the seventeenth century. Bernini often expressed in marble minute forms, such as the veins, &c. which in nature are scarcely noticeable, except when marked by a difference of colour. In white casts from the life, of a woman's hand for instance, one is shocked by the coarseness of the skin, which appears so smooth and delicate in nature.

In architecture the disposition of lines and forms in colour, of course materially affect the moulded forms, and may be in direct contradiction to them. The bird's-mouth moulding as it is usually painted, becomes a leaf moulding. Many antiquaries insist upon painting an egg-and-tongue ornament upon the echinus of the Doric cap. One of its chief charms seems to be the beautiful combination of the circle in perspective with the sectional curve of the echinus, and this is entirely disguised by the cutting of painted lines (in direction of the sectional curve) upon the horizontal circle; and a quarter round, or any other clumsy curve, would answer the purpose almost as well.*

THE BEAUTIFUL IN ART.

MUCH has been written on the subject of beauty in art. Criticism, which ought to love with a sincere love the study of the fine arts, and fill its soul with its noble impressions, is easy compared to art, which is difficult, and has been regarded as a necessary good to the progress of the arts, but has often been useless to artists in constant commissions, whose approved works have contained far better precepts from the examples they afforded than criticism could: and innumerable canons have proved vain and ineffectual, and actually tended to bring on the corruption and decline of art. This has not hindered some good writers from expressing their ideas and sentiments on the subject of beauty. The English have written a great deal on it, and the different theories of the principal writers have been collected and reviewed in more than one work. The authors have been too metaphysical, and, had they been less so, they would have been more understood, and more appreciated by the public, distinguished as it is for its practical genius. Of all the people of Europe, it seems there is not any who better announce the sentiment of beauty than the Italians and the French. As to the sentiment of the sublime and energetic, we think it is claimed in a most decided manner by the Germans, the English, and the Spanish. The pure and delicate by which both are manifested is almost unknown in Holland. The English language, as well as its architecture, is characterized by its energy. The sentiment of the *sublime*, to which the French nation is far from being a stranger, keeps, among them, subordinate to that of *beauty*. Beauty is the national characteristic of their language, their sculpture, and their architecture.

Kant, D'Alembert, and others have attempted to establish that every one possesses in himself an innate aptitude to conceive the beautiful and the sublime; that there is in the human being a faculty appointed to pronounce judgments upon objects which affect in a most lively manner our existence. The property of beauty is to operate in whatever work with ease, and to be agreeable and easy to comprehend at a glance: the trace of labour ought to escape in its free actions, disengaged and free from constraint: another law rules the sublime, it is by great efforts and difficulties conquered that it claims the right of our admiration. If the depth of meditation and an attention a long time sustained are noble, they are equally painful, and little suit any one, with whom the graces ought only to reveal the presence of a beautiful nature. Liberty of mind, and the union of innate ideas, which constitute genius, are not less necessary to feel all the beauty of a work, than to compose it. To be a good spectator, you must have tranquillity of soul and serenity of imagination. The mind must be correspondent to the art or the science which we wish to know; and our knowledge ought to be greater than that found in the works we study and judge. The *beautiful* is ravishing, and touches us, or it is lovely, and seduces us: in the first case, it holds with the *sublime*, and the soul that feels this sentiment enjoys it with a satisfied and thoughtful reflection: in the second, it is moved by a more expansive joy. Of these two modes of sensation, one is peculiar to the Italians, and the other to the French. Beauty is a sort of shrine for the affections of the soul. A poet said that every new work of Raffaelle made a painter. Quintillian said that the Olympian Jove and every new statue of a deity by the hand of Phidias, added to the religion of the people. The expression of the sublime has three manners of producing itself in national characters: impressed with a certain horror, it will incline towards the gigantic, or it will belong to the noble kind, or it will enter into the domain of the magnificent. The sublime ought always to be great: the beautiful may also be small. The sublime ought to be beautiful: the beautiful may suffer from being over-ornamented: arsenals ought to be noble and simple; palaces of residence, magnificent; villas beautiful and nobly decorated.* Such is the force of *greatness of manner*, that a small building will give more noble ideas to the mind than another twenty times more extensive with regard to its mass, where the manner is common or neglected.† The compositions of architecture are more susceptible of the *grandiose* than those of any other art. By it the colossal differs from the gigantic. The *grandiose*, in all works of art, is one of the qualities that most contributes to beauty.‡ In painting, largeness of treatment is not at all dependent on the size of the panel or the canvas. The "Vision of Ezekiel," by Raffaelle, in the Pitti Palace, Florence, in largeness of treatment perhaps excels any of his other works, and it is painted in a panel of about sixteen by eighteen or twenty inches; and many of the works of the old masters, specially celebrated for largeness in treatment, are small in dimensions.§

D'Alembert says, that in effect, the source of our pleasure and dislike is only and entirely in us: we find them within ourselves, in looking there attentively, general and invariable rules of taste, which are like the touchstone on the test of which all the productions of talent can be submitted. There are in the arts of taste, beauties of expression of which all men are born judges; and these beauties are not always those to which the pure artist is the most sensible. The beauties of expression are, some the works of nature, others the fruit of labour; and the artist, like other men, esteems things according to what they cost him. It is not that in general artists are the natural judges of arts, if they are either blinded by partiality or led away by subtilty and chicanery. Philosophy has a similar analysis in the truths of sentiment which have connection with matters of taste. Enlightened by a subtle and profound metaphysics, it distinguishes the principles of the general and common taste of the people from those which are modified by the character, the genius, the degree of sensibility of nations, or of individuals: it separates by this means the essential beauty from the conventual beauty: equally distant from a mechanical decision without principles, and too subtle a discussion, it carries the analysis of sentiment as far as it ought to go: it studies the impression, without giving an account to itself or others, and when it has made its pleasures agree with its reason, it grieves without pride, and without seeking to convince them, those who have received, whether from nature or from habit, another mode of feeling.‖

It is not to produce beauties, but to hide faults, that the great masters have designed the rules. Nature forms men of genius, as she forms in the bosom of the earth the precious metals, ugly, deformed, full of alloy and foreign matter. Art can only do for genius what it can do for these metals: it can add nothing to their substances, it disengages them from all that is foreign to them, and discovers the work of nature.

Taste, although little common, is not arbitrary: this truth is equally acknowledged by those who reduce the taste to feeling, and by these who would limit it to reason. But it does not extend to all the beauties of which a work of art is susceptible. The striking and sublime in it, which alike seize all minds, which nature produces without effort in all ages and among all people, and of which in consequence all minds, all ages, and all people are judges. There is that which touches only sensible souls, and which escapes others. The beauties of this kind are truly of a secondary order; for that which is great is preferable to that which is fine: they are, nevertheless, those which demand the most sagacity to be produced, and delicacy to be felt; so they are more frequent in the nations, among whom the refinements and pleasures of society have heightened the art of living and enjoying. This kind of beauties made for the few, is properly the object of taste, which may be defined the talent of discerning in the works of art what ought to please sensible souls, and what will disgust them. If taste is not arbitrary, it is then founded on incontestable principles, and that which is a necessary consequence, there ought to be no work of art of which we cannot judge, in applying to it these principles.*

The advantages that the liberal arts have over the mechanical arts by the labour which the first demand from the mind, and by the difficulty of excelling in them, is sufficiently compensated by the very superior utility which the latter for the greater part procure to us. It is even this utility which has forced men to reduce them to operations purely mechanical, to facilitate the practice of them to a greater number of men. But society, in justly respecting the great geniuses who enlighten it, ought not to look with disdain on the hands who serve it. A painter may be, from the low view he takes of art, from his inability to render his sensations and his thoughts, only an artizan more or less skilful, but not an artist; whilst the artizan, though employed in a lower department, may make his talents and his invention superior to it; may show his capabilities of excelling in the higher walks of art, and show what perfection he may reach in the workmanship of his genius. Obscurity of destiny may for a time shroud the works which reflect the image of a noble mind; and humble labours may conceal performances which exceed their promise. Well-directed routine and habitual experiences, may give to artizans, even in their rudest operations, a presentiment of genius which has the character of inspiration. There can be no doubt, that the thought and the skill of precision in manual works, that is to say, of the rigorous execution of the faithful reproduction of geometric and artistic forms, have exercised a useful influence upon the recent progress of our mechanical science. There are some works, it is true, purely mechanical, and whose monotonous repetition rarely puts the faculties of the mind into exercise; as, for example, the textile arts, which are immense and fertile branches of industry, and are the foundation of the fortune and the power of western nations. These beautiful industries, an imitation or a pure emanation of similar ancient and splendid industries of the East, are, in reality, very ingenious; and their happy mechanical and geometrical combinations are still to-day an object of our admiration. These rich weavings are unequalled for their fineness and beauty, for the solidity of the colours, and the intelligent art with which the finest threads of textile materials are elaborated and woven to constitute the chain and the body of stuffs, by their network and reticulation, according to mathematical and artistic laws. These admirable productions, principal and primitive sources of the riches of the civilization of Indo-Persia, are the result of many ages of accumulated force, the slow, painful, and incessant manual collaboration of an exuberant population of slaves and of pariahs.

It would not be difficult to prove that the theory of the mechanical arts is the same as that of the fine arts; that they rest equally upon the ideas of the beautiful, which resolve themselves always into those of the good. We with difficulty equal the ancients in the productions which appeal to the mind and to the judgment, to the taste and to the imagination; but we much surpass them in every thing which affects the multiplication, the vulgarising, and the rapid economical reproduction of objects of perfection, or of material artistic, and intellectual enjoyments.† It is, in deed, in the perfectioning the slow, gradual, but incessant and indefinite increase of discoveries

* To be continued.

* Kant, "*Sur le Beau et le Sublime*," translated by Kératry.
† Addison, on the "Pleasures of the Imagination."
‡ Boutard.
§ North British Review, August, 1858. No. LVII.
‖ D'Alembert, "Œuvres Philosophiques."

* D'Alembert.
† "Travaux des Commissions Françaises sur l'Industrie des Nations." Imperial press. Paris.

and ideas of chemistry, physics, mechanics, geometry, or mathematics, applied to the satisfaction of our wants, where lies the perfectibility of the human race, still more than in the pretended progress of moral, philosophical, and artistic ideas, of which antiquity has left us models or examples not yet surpassed in our times; and yet the fictile and the Faenza arts do not seem to be wanting in a claim to the fine arts. Their productions, turned and fashioned into the graceful forms given them by a potter as skilful as Bernard Palissy, are evidences of what that instrument of instruments, the human hand, can perform. Of these Paris makes a great *spécialité*; exhibiting useful and ornamental articles of furniture for the toilet and the service of the table; and the shops in the peristyles and arcades of the Palais Royal which are magazines for these arts and for carved and engraved porcelain, and fine stones and cameos richly set in gold, flower vases, goblets, chalices, and fans of crystal, are most dazzling, glittering in their sheen, and they give to the place quite the aspect of an Oriental bazaar. For these articles of art and luxury there are large *ateliers*. No one, we think, will dispute the beauty there is in machines to saw, to dress, to carve, and to polish different stones, crystals, and other hard bodies; the machines used to elevate the materials which enter into the construction of edifices; the means of ventilation and drainage; the objects serving decoration and models of public edifices: they are objects which created a great interest in the Universal Exhibition of 1851. Among the liberal arts which have been reduced to principles, those which propose the imitation of nature have been called fine arts, because they have principally pleasure for their object; but this is not the only thing which distinguishes them from the liberal arts more necessary or more useful, as grammar, logic, and morals. These last have fixed and determined rules, which every man can transmit to another, whereas the practice of the fine arts consists chiefly in invention which is not derived so much from its laws as from genius; the rules which have been written upon these arts are properly but the mechanical part,—they produce a similar effect as the telescope, they only aid those who can see. It results from what we have said, that the different manner in which our mind operates upon objects, and the different uses and impressions which it draws from these objects, are the first means presented to us to discern in general our knowledge of both. All have connection with our wants, either of absolute necessity or of convenience and pleasure, or even of custom and caprice. The more that these wants are foreign or difficult to satisfy, the more slow in appearance is the knowledge destined to that end.* In art in general, and in painting in particular, the signs of representation that one employs are often conventional in a high degree, so that when they ought not to vary but with the natural objects of which they are the representation, they vary, on the contrary, perpetually with epochs, with nations, with schools, with individuals. The beautiful in art proceeds absolutely and only from the human thought set free from every other servitude than that of manifesting itself by the representation of natural objects.

The greater part of the remarks of Cicognara, in his work, "Del Bello,"† apply to the arts of design. Reasoning of absolute and essential beauty, and of its force upon us, he shows the why and the wherefore they are distinguished from relative beauty. Grace, sublimity, ideal beauty, are distinctly treated as consequences of principles which he had already established, and as being of greater or less perfection of the same thing. Sometimes we see these existing separately and undivided in one work: sometimes we see them conjoined. One formula in art is that the essence of the beautiful is unity in variety: there are works, however, that are exceptions to this; and we see beauty existing above and beyond the conditions of unity and of variety, linked together. A work unites often these two qualities without being beautiful. The Apollo of the Belvedere, in the Vatican, is not varied: the "Transfiguration" is not one, and they are both admirable pieces.‡ As in human characters, so in sculpture, there are minute differences between qualities which seem the same and those we discover with difficulty. It is easy to know the qualities when they are rendered single, perfect, and entire; but it requires much penetration and delicacy to separate or sift what is confounded. Everything which makes unity by the union and blending together of many attributes, produces agreeable and beautiful things. In the fine arts, the ideal is said particularly of that abstract assemblage or union of perfections of which the genius forms the idea, but which is above every sensible beauty. Simplicity is the natural companion of beauty: the first follows the second, as the shadow follows the body. Hogarth, by whom the English school of art was founded in 1734, in his "Analysis of Beauty," gave the world what he called the *line of beauty*—the true, and the simple, and the ideal line. Michelangelo's advice to his pupils was always to make a figure or a group of objects pyramidal, one of the most simple of figures, and one of the most pleasing: for example, take the tripods, the five and seven-sided polygon, and the triangle—the indentations that nature gives generally to leaves, flowers, and stems of plants. The simplicity of the oval is preferred to that of the circle, as the triangle is to the square, the pyramid to the cube; and we see that the Great Artist of every creative beauty selected the oval form as a vault to the temple of the earth. Elegance and nobility may be combined: it is a great thing to know and observe the limits of every kind of style in the arts and composition.

Style imparts grandeur to the simplest and most common things: style, taken as the just expression of what is beautiful in the ideal, is the most important part of art, and indeed is the art itself. Hence, Cicognara lays down three states of imitation of the artist;—1. When he proposes to imitate objects such as they are presented to him, servilely and indistinctly. 2. When he chooses none, and does not refuse certain others, adding to them his own ideas, or altering the disposition. 3. When finally he unites the parts the most perfect of different objects, and forms one only chosen by himself. The first of these imitations is the beginning of art; the second, the progress; the third, the perfection. He adds, political and extraordinary circumstances, and natural and local, have much contributed to make the arts pass more or less rapidly from one or the other of these three states; and it is beyond all doubt that we owe the excellence of their progress to the imitation of that which nature has produced most excellent and most perfect. The fine arts have most flourished in a beautiful climate, where the productions of its imitation are always the most perfect. But the imitation of nature alone ought not to be the aim of the artist: his work must bear the stamp and the forms of his own imagination. Quantity is the cause of beauty and grandeur. To know how to give to the creatures of architecture an expression of majesty from mere bulk, is one of the secrets and difficulties of the art.

Some have thought that architecture was an art in which none but a geometrician can excel. Geometry is an inexhaustible study to the practical man and to the philosopher. In the sphere of its utility it is infinitely more extended than that of any abstract science, and it is, without contradiction, the base of our true knowledge. Our mind, with all its diversified faculties, has a certain original unity, sovereign, eternal, perfect, which is the essential rule of beauty, and which is to be sought to be expressed in the practice of the art. Variety, regularity, order, proportion, are necessary. We have only to witness the scenes and external forms of nature, to see how these admirable qualities prevail in them; one reason being that everything concurs to the same end; every work is a whole; that an equal consideration is given to all: *amor omnibus idem*; and that nature executes them on an eternal plan from which she never departs. Everything in the universe is conformable to good order: everything concurs to the general good, and is made for the best,—is such that it cannot be better, and is perfectly good. Law and order then being here necessities, it is certain that out of the unbridled license of individual taste no good can come. Foundations, and results of order in the elevations of a building, are necessary to escape confusion and ruin. There should be in the decoration no obtrusive parts, no interruptions of that regular order of styles, that *surveillance* which is congenial and con-natural to the well-regulated mind that contemplates and enjoys it: there should be no rarities or eccentricities of creative genius, no pieces broken or detached from that principle of order and proportion which should harmonise, unite, and league together into one whole all the parts which compose it. The useful, too, must circumscribe everything; which will not exclude the beautiful, the agreeable, or the fascinating; for there is no standard of grace in such an art but what is directly or indirectly dependent on utility. What the poet, in his "Essay on Man," says of order in society, may here be applied:—

> "Order is heaven's first law, and this confest,
> Some are and must be greater than the rest."
> *Pope.*

The lowest must be knit to the highest. Order and harmony in everything are the foundation of beauty, and it is the assemblage of those parts or principles which we have mentioned only that have a power of forming a beautiful whole in architecture, but are more or less needed in all the arts, are all established, and pursue their career and their destiny on much the same principles.

On this subject a celebrated French philosopher* writes, "A constant fact is that, by a kind of sympathy, the sentiment and the love of harmony, of proportion, and of order, adjusts the temperament, strengthens the social affections, and supports virtue, which is, in itself, a love of order, of proportion, and of harmony, in manners and in conduct. In the most frivolous subjects, order strikes and is approved; but if the order and the beauty of the universe be once the objects of our admiration and of our love, our affections will participate in the grandeur and in the magnificence of the subject; and the *elegant* sensibility for beauty conducts us to ecstasy. Indeed, whilst but a little of harmony and some proportions remarked in the productions of the sciences or the arts transport with admiration masters and connoisseurs, can it be possible to contemplate a divine work without experiencing the sublimest delights? In every grateful and sensible heart, admiration for the real beauty of the universe is just, natural, and necessary; nor can man attain to moral perfection, or arrive at a supreme degree of virtue, without the knowledge of God." On this account the attractions of beautiful objects and the pure elements of design should be made a part of the education of all youths, and by that means cherish the better feelings and tendencies in them, and cultivate that disposition after beauty which is natural to them. Such national institutions would be an invaluable advantage to the individuals, and a source of prosperity and splendour to states. But for all these useful things the intervention of the legislation is the more necessary, and the most enlightened governors and heads of schools and academies ought to lend their hands to render generally-known principles conformable to such an important object. The same writer as that last quoted utters the following excellent words:—"What good would come to men, if all the arts of imitation were proposed as a common object, and concurred one day with the laws to make us love virtue and to hate vice!" It is to the philosopher to invite them: it is to him to address himself to the poet, to the painter, to the musician, and to cry aloud to them, "Men of genius, for what has Heaven gifted you?" If this were well understood, the productions of sensuality would be no longer visible on the walls of our palaces; the human voice would no longer be the organ of crimes; the taste and the manners would soon be on their undisturbed progress.

F. LUSH.

* D'Alembert, "Œuvres Philosophiques."
† Edition, Firenze, 1806.
‡ Théophile Gautier, editor of *L'Artiste*, a weekly journal.

* Denis Diderot. "Œuvres Philosophiques." Tome 1. *Essai sur le Mérite et la Vertu.*

THE REVIVAL OF MEDIÆVAL ARCHITECTURE.

I QUITE sympathise with Mr. Parker in his wish to avoid a lengthened controversy, but some reply to him is absolutely necessary. He complains that I "carefully" avoided giving a single date to prove that the Italian examples which I adduced were in an "Early Italian Gothic style," and that without dates my "arguments are worth nothing." To this I answer that I used no "arguments" which required the support of Mr. Parker's favourite dates, and that Mr. Parker himself gave none; I simply stated a fact which it would be insane to advance if it were not true, for in these days an acquaintance with Genoa, Assisi, Vercelli, or Ferrara, is no uncommon thing, and though Mr. Parker's courtesy allows him to say that my statements are "worth nothing," I cannot help thinking that your readers (most of whom probably know something of the buildings I mentioned), will agree with me in not thinking much of the assertions of such a disputant.

Mr. Parker's next statement scarcely requires an answer. He denies that he ever said that it was desirable for architects to go to the East by way of Anjou, &c. Yet, if your readers will refer to his original letter and my answer, they will see that I quoted his own words. If there is any mistake, therefore, it is Mr. Parker's, and not mine. He said, "whatever the cause, this was the

line which English architects in the thirteenth century *were most likely to take*, and this seems the most *natural line for us now to follow*." "But with Lombardy they had no intercourse at all, and it is the last *place* we should go to for *authorities*." Your readers will see that in no respect whatever have I misrepresented this quaintly antiquarian view. Indeed, I might almost have been justified in supposing that Mr. Parker's own wishes would tend towards some scheme for dredging out the silted up port of Aigues Mortes, in order that modern architectural students might have the advantage of embarking for Rome (in mediæval vessels of course) from the port which their thirteenth-century predecessors "were likely to have" started from before them!

Then, in the next place, Mr. Parker denies that he intended to point out the hospital at Angers, as the type which our English architects followed. "He said no such nonsense." Nevertheless, he did say, "I believe it to be the earliest Gothic building in existence, and *the origin of the Early English style*." There it is in legible type, of Mr. Parker's own printing, and I am not prepared to dispute his present statement, that it is very like nonsense.

Then Mr. Parker talks of my "*mere assumption* that the colony in Perigord was Venetian, and that S. Front was copied from S. Mark, at Venice." Permit me, then, as my adversary has written a book, to quote his own words on this point. In the thirty-fifth volume of the Archæologia," p. 36, Mr. Parker says:—

"M. Felix de Verneilh, in his valuable work on the Byzantine Architecture of France, has shown so remarkable a resemblance of plan, dimensions, and details, between the Cathedral of S. Front and the Church of S. Mark, at Venice, that it seems difficult to avoid the conclusion at which he arrives that they were either the work of the same architect, or that S. Front was built by workmen from Venice, in exact imitation of S. Mark's. Almost the only difference is that the arches of S. Front are pointed." "The recorded dates of the two buildings also agree remarkably with the hypothesis that they were in some degree the work of the same hands. The first stone of S. Mark's was laid in 977." "The Church of S. Front was commenced in 984, by Bishop Frotaire, and finished about 1047, in which year it was dedicated by Archbishop Aymon."

Again, in vol. xxxiv. at page 273, Mr. Parker tells us:—"According to some well-informed French antiquaries, the original type of these peculiar churches, was the Cathedral of Saint Frond, at Perigueux, and this is said to have been built by a Venetian colony, very soon after S. Mark's, at Venice, or between 976 and 1047. The very massive character and extreme plainness of that building agrees very well with the early date assigned to it, and the use of the pointed arches to carry the cupola, may be accounted for by its Eastern origin."

It will be seen that Mr. Parker's right to talk of my "assumption" in this matter is rather worse than doubtful; and after quoting what I find M. Viollet le Duc saying on this point, I think I may safely leave it for the judgment of your readers. He says:—"At Perigueux, from about the end of the tenth century, the cathedral of S. Front was erected under the influence of the domed church of S. Mark, at Venice. *The plan reproduced not only the form, but even the dimensions of S. Mark, with very slight differences.*" (Dict. vol. i. p. 170.)

Finally, Mr. Parker says it is evident, I "do not understand the distinctive principle of French and English vaulting" to which he referred; but I think I need hardly stop to discuss this question with him; I can only say, as I said before, that the Angevine systems of vaulting were very peculiar, and at the same time exceedingly unlike the English; and that if our thirteenth-century architects had borrowed any of their ideas from Anjou, it is utterly impossible that it should not have been at once evident in their work. Until Mr. Parker will show us an English example of an Angevine vault, with its edge-roll moulding in place of ribs, its excessively domical sections, and its cells filled in with stones, exactly parallel with the centre or ridge of each cell, I think I may be well content to leave my statement for what it is worth against his mistaken conception or recollection of the facts.

It would be easy to quote a succession of passages from Mr. Parker's papers in the "Archæologia," to show, as M. de Verneilh has also shown, how these Angevine domical vaults were derived from S. Front, at Perigueux, through Angoulême, Fontevrault, and other examples, in a most unmistakeable succession. But as your space is valuable, I will not do this at present. I may, however, call attention to the very curious piece of groining over the sacristy of the church of S. Radigonde, at Poitiers, in which we find exactly the same construction of the vaults as in the chapel of S. John's Hospital at Angers, but without a single pointed arch. It is a square room, vaulted in the form of a regular dome, the cells being also domical, and all their masonry arranged in vertical lines parallel with the centre of each cell. In the groining of the "crossing" of S. Pierre, at Saumur, we have a still more complete dome, with eight useless ribs under it; but in this case the masonry of the cells is built in regular horizontal courses. It would be impossible to find two examples more utterly unlike any in England, yet they are fair illustrations of the Angevine typal systems of vaulting. I think Mr. Parker would find in the nave of the little church of S. Laurent, at Beaulieu, near Loches (not to be confounded with the curious Abbey church described by Mr. Petit), an example of even more interest than any in Angers. The vaulting is exactly similar to that in the Hospital of S. John, whilst the shafts are almost as light in proportion to their height, and the character of the sculpture is so purely Byzantine that I can hardly doubt that it is of earlier date. The arrangement of the masonry in these vaults ought always to be carefully noted, and it is worth observation that in the only cases in which Mr. Petit has shown it in his "Architectural Studies in France" his engraver has drawn it quite wrongly: he has drawn the lines of masonry parallel with the wall-ribs, or "formerets," instead of with the centre of the cell, as it almost invariably is in execution in these French examples.

There are, however, one or two other points on which I should like Mr. Parker to speak a few words. It will be remembered that the whole gist of his advice is that we should go to these English provinces if we wish to revive the architecture of the thirteenth century: remembering this, your readers will be amused to read the following statement made by him in the "Archæologia," vol. xxxiv. p. 274:—

In these provinces "scarcely any churches appear to have been built between the twelfth and the end of the fifteenth century. The interval exactly agrees with the period of the English dominion, which seems to have been a continual struggle." Again, in vol. xxxvi. p. 324, he says: "I entered on the examination of the English provinces of France in the expectation of finding the effect of English influence in the architecture of those provinces. In this expectation I was entirely mistaken—there is *none whatever*." And again, "The different provinces differ much more from each other in their architectural character *than the northern provinces do from England*."

I may be well content to leave this matter where it now stands but I may as well say that Mr. Parker's boasted example at Angers is not, in any real sense, thoroughly Gothic. It is Romanesque in all its detail, and the fact that it is covered with a pointed vault does not, any more than the lightness of the shafts, make it an example to be quoted as "the origin of the Early English style." In the barn close by, where there is not a single pointed arch visible, the columns are even lighter in proportion than in the hospital, whilst no one who knows much about the real character of Gothic work, as evidenced in sculpture and moulding, would hesitate in saying that the coeval church of Notre Dame, Paris, is in these respects much more advanced in style than is this original of the Early English style.

Your readers will see, I think, that I have made good my ground. They have seen that Mr. Parker recommends architectural students to take a very peculiar and out-of-the-way road to the East, in order to study thirteenth-century architecture, in a district in which, according to his own statements elsewhere, scarcely any churches were built in the thirteenth century. He objects to their studying the architecture of Lombardy, though on his own showing the whole architecture of his favourite country was directly derived from Venice; and he leaves his unhappy friends at the silted-up port of Aigues Mortes, with no hint as to how they are to get over the slight difficulty about sailing thence in its present condition to Civita Vecchia.

I may, indeed, well protest against the advice of such a teacher. Mr. Scott hardly needs to be told by him where to go for "authorities," and will, I am sure, agree with me that, whilst in the course of architectural education, it is well that we should go even to Italy, yet, in place of "authorities," what we require is a knowledge of our wants, and a resolute determination to meet them naturally and really, with the best art that we can severally command; and, though not in a merely antiquarian spirit, with reverence and respect for the teaching of old art wherever it was best, purest, and most suggestive.

GEORGE EDMUND STREET.

NATIONAL PORTRAIT GALLERY.

THE trustees have opened the collection which has been commenced at No. 29, Great George-street, Westminster. It consists of fifty-seven portraits, of varied degrees of value and interest, disposed in three rooms on the first-floor, and on the staircase. The rooms are ill-lighted: some of the pictures, indeed, 39 and 40, for example, cannot possibly be seen. The arrangement may, we suppose, be considered merely temporary; nevertheless, we must think that Government would have done more wisely had they enabled the trustees to open the collection in a fitting building. The Chandos Shakspeare (21), Reynolds's own portrait of himself (4), General Wolfe (32), Stothard (30), are amongst those which will attract attention.

The second portrait in the list, is that of an architect, James Stuart. It is a miniature on ivory, painter unknown, and was presented by Stuart's son, now a lieutenant in the Royal navy. This is what Mr. Scharf, the secretary of the trustees, says of the subject of it:—

"James Stuart, born in London 1713, died 1788. An architect, author of the 'Antiquities of Athens,' and the first, of modern times, to introduce a knowledge of the true Greek architecture to the west of Europe. Hence his frequent designation of 'Athenian Stuart.'

The death of his father, a mariner, left him at a very early age the sole support of a mother and large family, whom he maintained principally by painting ladies' fans. In 1742, however, he was enabled to visit Rome, where he resided for seven years. During that time he painted industriously, and studied languages and antiquities at the Propaganda; and in 1750, under the patronage of the reigning Pontiff, Benedict XIV. he published an essay at Rome, 'De Obelisco Cæsaris,' &c. Being encouraged by numerous friends and subscribers, Stuart and his friend Revett determined to explore the almost forgotten ruins of Athens. They reached their destination in 1751, and remained in Greece till the close of 1753, returning to England in 1755. Only the first volume of the 'Antiquities' was published (1762), during Stuart's lifetime. The subsequent volumes, edited by Newton and Reveley, appeared in 1790 and 1794."

There is a good portrait, too, of the architect of Somerset House, by Reynolds. The gallery is now open to the public on Wednesdays and Saturdays, by tickets, obtainable on application to Messrs. Colnaghi, Pall-mall East; Messrs. Graves, Pall-mall; and Mr. John Smith, New Bond-street. Why there should be any necessity for tickets we do not see, and hope this obstacle to walking in at once, without previous arrangement, will soon be removed. The nature of the exhibition as present is not such as to render likely the presence of larger numbers than the house could accommodate.

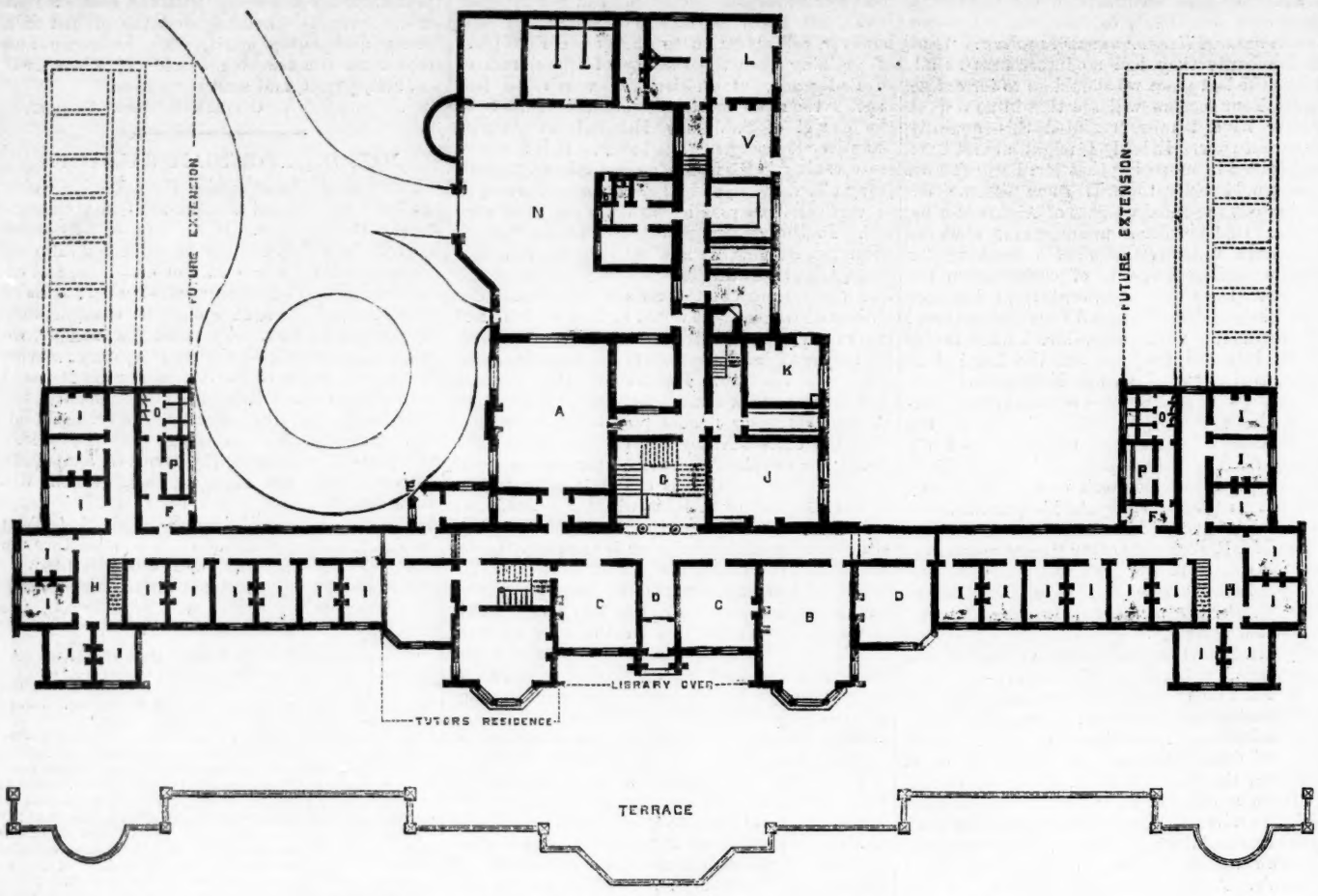
MORAL EFFECTS OF A TASTE FOR FLOWERS.

A CORRESPONDENT of the *Labourer's Friend* sends the following extract from an address delivered before the British Association, "On some Practical Results derivable from the Study of Botany:"—

"Mr. Ward proceeded to urge the importance of cultivating a taste for legitimate horticultural pursuits among the members of the labouring population, as it was a well-established fact, that, whenever a pink, or a carnation, or a rose was seen outside a cottage, there was a potato or a cabbage for the pot within; that if there were not happiness, there was the nearest approach to it in this world, content,—

"'Yes, in a poor man's garden grow,
Far more than herbs or flowers,
Kind thoughts, contentment, peace of mind,
And joy for weary hours.'"

And an anecdote is added, in reference to a clergyman who had converted "a wild and lawless tenantry" into "the most contented and happy set of villagers in all Yorkshire," by cultivating a taste for flowers amongst them. Some may doubt whether the good clergyman did not help the process by means of a few of the white and yellow lilies that bloomed in his trowsers' pockets; but there is no doubt that a taste for flowers—and perhaps we might add for singing-birds—is a sure indication of at least the existence of something like contentment, or even happiness, in a workman's dwelling; and why should not a concomitant of such circumstances be an occasional stimulant towards its realization, as well as towards the engentlement—if we might coin a word for the occasion—of those whose attention is turned towards such delicate and gentle "things of beauty" as a favourite flower, or a singing-bird?



NORTHERN BAPTIST COLLEGE, RAWDEN.—*Plan of Ground Floor.*

ASSOCIATION FOR PUBLIC SAFETY.

FALL OF BUILDINGS.

THE recent sad calamity in Great George-street, Liverpool, the fall of houses some short time back in Tottenham-court-road, and many similar occurrences, which each of your readers, no doubt, recollects, induce me to put forward a suggestion, which, if effectively carried out, might probably obviate, in a great measure, the recurrence of such frightful accidents. Most people are probably aware that there exists at present in Manchester an Association of Engineers, which has been formed with a view of inquiring into the cause of, and indicating remedies for, the explosion of steam boilers, until recently a lamentably frequent occurrence in that city, and in fact throughout the large manufacturing districts of the north generally. The owners and proprietors of mills and factories—themselves, in many instances, altogether ignorant of the scientific principles of the steam power which they employed,—found themselves under the necessity of placing the management of their machinery under the control of mechanics who understood little more than the simple practical working of the engines placed under their charge. It became evident to the masters that occasional professional inspection of their machinery was required, and this want led to the establishment of the above-named association, which consists of a committee of eminent engineers, an inspector appointed by them, and the requisite staff of assistants. Any one employing steam power and being desirous of ascertaining its condition, can, on payment of a certain fee, not very large in amount, have his machinery examined by the inspector appointed by the association, to whom a report is made, and the result of the inquiries furnished to the applicant. Such inspections are of daily occurrence: the value of the advantage afforded is becoming more and more highly estimated, and the working of the association has been altogether most successful. Now it occurs to me, and this is the suggestion I venture to offer,—that a committee of architects, or a joint committee of architects and master builders, might be very advantageously formed for the purpose of exercising functions similar, as respects buildings of all kinds, to those performed by the Association of Engineers in regard to steam machinery; and local associations might be formed throughout the country, either as independent bodies, or acting under a central metropolitan committee. The details are, of course, matter for consideration. My present object is simply to suggest the scheme. That individual interests may lead to great opposition to it I do not venture to doubt; and still less can I doubt that such a plan would be open to some real objections; but these, when weighed against all the advantages it would afford and all the benefits it would confer, are, I am ready to believe, trivial and unimportant.

W. M. BUCKNALL.

NORTHERN BAPTIST COLLEGE, RAWDEN, NEAR BRADFORD.

THE committee appointed for the erection of this building advertised for plans twelve months since, and received upwards of forty designs in competition, when that furnished by Mr. H. J. Paull, of Cardiff, was selected for execution, and he was entrusted with the superintendence of the work.

Tenders were obtained, and the following accepted, viz.;—1. Excavator, bricklayer, and mason, Israel Thornton; 3,390*l.* 10s. 2. Carpenter and joiner, Booth Illingworth; 1,468*l.* 3. Plasterers and slaters, Duckworth and Howroyd; 669*l.* 10s. 4. Ironwork, Lawrence and Robinson; 452*l.* 5. Plumber, glazier, and painter, John Stead, 810*l.* Total, 6,790*l.* All the contractors are Bradford tradesmen.

The foundation-stone of the building was laid by Mr. Thomas Aked, of Shipley Grange, on the 4th of August, 1857, and the works have made considerable progress. The lower portions of the building are now roofed in, and the whole will be under cover in about three or four weeks.

The walls are built of the local "delf" stone, common hammer-dressed on the face, and pointed with dark mortar. The dressings and quoins are of Rawden-hill stone, and sand-stone raised on the site. The roofs are slated, Portmadoc and Bangor slates being laid in alternate lines, which produce contrast of colour.

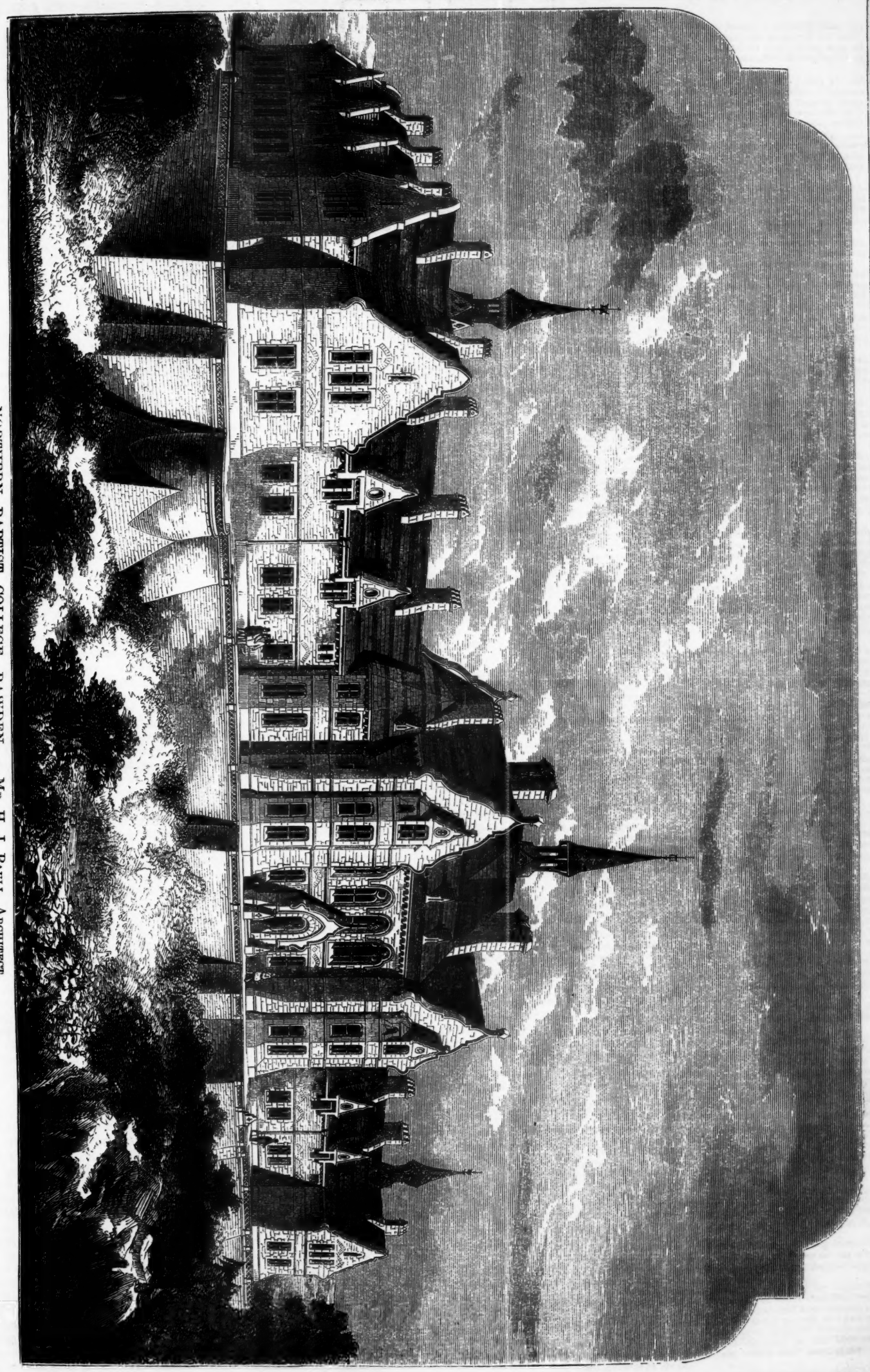
The terrace wall in front is built "dry" with stone from the site. This terrace was not included in the original contract, and will cost about 500*l.*

"The front of the building will be devoted to the president's residence, the educational apartments, and the students' rooms, the latter ranging on either side of the former departments, which last appropriately occupy the central division. In the rear, and branching at right angles from the centre of the front building, will be the refectory and the domestic offices, which will thus be easily accessible from all parts of the college. A spacious front door-way opens into an entrance-hall of good proportions, which leads to a corridor of communication, running right and left of the whole building. Facing the hall is the principal staircase, which leads to the library and other apartments above. Glass screens will be placed in the long corridor, in order to check currents of air, and also to separate the students' apartments from the more public parts of the college. This arrangement will secure privacy to the rooms of the students. Thirteen studies are provided on the ground-floor, on the west side of the centre building, and thirteen on the east side, each room being 11 feet by 9 feet, and 9 feet 6 inches high. Over each is placed a corresponding dormitory, approached by staircases in the wings. The proposed building will, therefore, accommodate at once twenty-six students; but the plans will admit of a ready enlargement of the building, without even a temporary interference with a single room, so as to afford accommodation to fifteen or twenty in addition. The lecture and class rooms (called "educational apartments") are in the centre of the buildings. They are entered from the corridor, and are equally accessible by all. The lecture-room is 18 feet by 24 feet, and the class-rooms are each 18 feet by 15 feet. All these have a uniform height of 13 feet. The library is on the one-pair floor, and is approached by the central staircase, which has a spacious landing in front of the library door. The dimensions are 39 feet by 26 feet, and 20 feet high. There is room for 10,000 volumes, 'octavo' being taken as the average size."

It is intended that the college shall be occupied in August next, and the contractors are bound to complete the building by that date.

References.

A. Dining-hall.
B. Lecture-room.
C C. Class-rooms.
D. Professors' room.
2 D. Entrance-hall.
E. Tutors' and carriage-entrance.
F F. Students' entrance.
G. Principal staircase.
H H. Students' staircase.
I. Studies.
J. Kitchen.
K. Scullery.
L. Wash-house.
M. Laundry.
N. Stable-yard and kitchen-court.
O O. W. C.
P P. Lavatory.



NORTHERN BAPTIST COLLEGE, RAWDEN.—MR. H. J. PAULL, ARCHITECT.

RISE AND PROGRESS OF MECHANICAL SCIENCE.

AT the Derby Working Men's Association, Mr. Fairbairn, F.R.S. has been delivering two lectures on this subject. In the first, after briefly sketching the progress of industrial art from the earliest periods down to a new era, Mr. Fairbairn directed attention to what had been accomplished during the last century in this country, dividing his subject into two parts, the first from 1750 (when the title of engineer was unknown in the vocabulary of science) to 1800, the second from 1800 to the present time; and in doing so noticed the building of Blackfriars and Westminster bridges, and the Eddystone Lighthouse. Two men especially had left behind them lasting monuments of progress—Smeaton and Brindley; the greatest work of the latter (a Derbyshire man) being the Bridgwater Canal, which was begun in 1759, and the first boat entered Manchester in 1762. Then followed the Union, or Great Trunk Canal; and after this time the country became penetrated in every direction by canals. Brindley was the first man who commenced the system of tunnelling hills and carrying aqueducts over valleys and rivers. And here, said Mr. Fairbairn, I would observe, to the young students in science and art before me, that I am of the same opinion as Brindley, who said nothing was to be obtained without labour—hard labour; and that if any young man fixes his aim on one object, he cannot fail of success. Every man's fortune is in his own hands, if he chooses to persevere and work hard. In proceeding, the lecturer remarked that to Watt and Arkwright they owed a debt of gratitude which they could never repay. During the reign of Elizabeth the country was so much cut up for wood for the purpose of smelting iron, that a prohibition was considered necessary; and on a recent visit to Sweden he had found a law in force which only allowed the use of a certain quantity of timber per annum. The introduction of coal for smelting purposes entirely changed the aspect of affairs. Mr. Fairbairn quoted from returns showing the gradual development of the iron trade from the year 1740 to 1854, and mentioned that at the present time the production could not be less than 3,200,000 tons of iron. This trade had been more advantageous to the country than a thousand Californias.

At the commencement of the second, Mr. Fairbairn said he came up to London forty-seven years ago. At that time, continued he, young men from the country found it very difficult to find employment in consequence of trades' unions. Mr. Rennie took me by the hand, so that I was better off than some, but having to go before a trade's union, I was declared illegitimate, and was turned adrift. These were times when men were masters, every man having 7s. wages a-day, whether he was good or bad, and his drink. I am sorry to say that injurious system is still in operation amongst particular trades. Hear what the *Times* says upon the Letterpress Printers' Union in reference to a recent dispute at Sheffield. [Mr. Fairbairn gave extracts from the article.] This is no new case, as I have found by experience both as journeyman and master. I leave it to your good sense to determine whether it is for the benefit of the operatives or the public, that the energies of individuals should be thus crippled, and the exercise of their professions illegally denied them. There were then three societies in London, one called the Old Society, the other the New Society, and the third the Independent Society. I went to the Old Society and was refused, and thus, after dancing attendance upon them for six weeks, with very little money in my pocket, and having to "box Harry" all the time, I was turned adrift. I then went into the country, and having obtained a little money, came back to London, and, meeting with a friend of mine, told him my case: he said I had gone to the wrong society, and that, if I had gone to the Independent Society instead of the old one, I should have been all right. Now, by the rules of these societies no man was allowed to work unless he had been apprenticed for seven years, or was the eldest son of a journeyman. Whether a man had talent or no talent was not the question at all. I am quite sure you will agree with me that a wide field, fair play, and no favour, is the best for all. The jealousies and exclusiveness of these trade unions had their origin, with other guilds, in the time of Elizabeth. At the peace of 1815, many of these evils were removed by Mr. Hume bringing a bill into Parliament for that purpose. Whether as a journeyman or master, I have always thought that a man ought to have the power to choose for himself, and I believe that the free trade principle, which we advocated in Manchester, is applicable to all trades and conditions of men. Mr. Fairbairn then alluded to the water-wheels constructed and the bridges built by Rennie. Southwark-bridge was one of the most perfect, as well as the largest and best specimen of an iron bridge, independent of the tubular bridge. No bridge in Europe was more remarkable for architectural beauty and harmony of curvature than Waterloo-bridge. Other bridges also proved that Rennie was without a rival, with the exception of Telford, during his useful career. After furnishing further proof of the skill of Rennie as civil engineer, Mr. Fairbairn spoke of Thomas Telford, who, besides being eminent in his profession, wrote a poem called "Eskdale," which he published at Shrewsbury, and an address to Robert Burns, whose centenary was to take place on the 25th of this month, and which all men, but particularly Scotchmen, were preparing to give due celebrity to.

He then referred to the works of Mr. James Walker and others, the growth of steam navigation, and the progress of the railway system, and closed an interesting address with some remarks on the electric cable, and the value of Mechanics' Institutions.

THE LABOUR MARKET IN VICTORIA.

SOME account of a misunderstanding between Messrs. Cornish and Bruce, railway contractors, and the Masons' Society of Victoria, appears in the *Melbourne Herald* in the shape of an advertisement. Messrs. Cornish and Bruce, the successful tenderers for certain railway works in the colony, had written to Mr. Bright, M.P. offering to find employment for 1,000 masons, at 14s. a day, and for 1,000 or 2,000 navvies, at 8s. a day, if that number were sent out from England. The publication of this letter, says the *Herald*, has excited the ire of the Masons' Society of Victoria, who have published an elaborate rejoinder to it. "The masons," they remark, "insist upon receiving 16s. per day for eight hours' labour; and any attempt made by the contractors to reduce that rate of wages, they declare to be injurious to them, and the act of 'mere money-seeking men, who are ready to gain their ends by sacrificing the welfare and happiness of the industrious classes.' There is an immense amount of building to be done here before this country is made really habitable for even its present population. There is no lack of capital for investment in building, and no indisposition to invest it in that way; and yet houses are not put up half as rapidly as they ought to be. Why is this? Ask any capitalist, and he will tell you that, although rents are high, building is not a lucrative (hardly a paying) investment, *solely because workmen's wages are too high*. The cost eats up the profit. Were wages reduced a little, the trade would get an impetus, and employment for workmen would be less "precarious" than they complain it is at present."

THE FALL OF THE STAIRCASE AT THE POLYTECHNIC INSTITUTION.

THE inquiry before Mr. Wakley, coroner, was resumed on Tuesday last at two o'clock, at the house in Cavendish-square, appertaining to the Institution. Mr. C. H. Smith, being recalled for further examination, reiterated his opinion, under many cross questions, that the accident commenced with the breaking away of the landing of the upper staircase; that though the letting in of the iron tended certainly to weaken the steps, they would have come down from the breaking away of the upper step, whether the iron had been let in or not, even if they had been quite new. Daniel Stroud, a young painter and glazier, J. P. Acton (in the house of Messrs. Bult and Co.), and Augustus Denman, who were present and fell, gave evidence to the effect that the *bottom* steps of the upper staircase gave way first.

Mr. Henry Jarvis, architect, on behalf of the father of the deceased child, differed from Mr. Smith as to the point of breakage:—"I am firmly of opinion that the fracture commenced at the edge of the top landing, where the iron was let into the stone. I cannot believe that, if the landing had been suspended by the rail, the steps would have given way, if they had not been cut to let in the iron treads. I judge this from experiments I have made. I consider that the cuttings weakened the steps. I do not believe that the fossil shells, &c. spoken of as having been found in the stone of the landing had anything to do with the accident."

Mr. T. Marsh Nelson, architect, appointed by the coroner, then read a report made after an inspection of the premises and materials. First describing the staircase and the alteration, the report proceeded:—

"From experiments I have made, I consider that the alteration of the staircase was not the cause of the accident, but that the fall was caused by the giving way of the bottom landing (or the steps immediately resting upon it) of the first flight.

The landing was supported by one end being pinned into the wall, and on one side by a joggle joint of imperfect construction, instead of having a solid bearing upon the iron girder, as is usual. The landing was cut to a feather edge, and nearly on the point of this edge rested the first of a flight of eighteen steps each 5 feet long, and although the steps were pinned into the wall, I consider the landing was insufficiently supported for such a staircase. A flaw or defect is also visible in the stone itself where it has broken.

The centre landing, I have already stated, was supported upon iron bearers. It was, like the staircase and other landings, much worn and vibrated considerably: this vibration would of course be communicated to the landing into which it was joggled.

The bottom step of the staircase, therefore, which rested upon this landing, never had the solid foundation so necessary for the construction of spiral staircases.

One of the steps near the landing had been broken, and mended with cramps. On the corresponding staircase, cracks are visible not only in the first step, but in the landing upon which it rests. These cracks appear to be anterior to the date of the accident. Had the other landing and steps been carefully examined before the accident, I have no doubt they would also have shown symptoms of insecurity.

A large portion of the surfaces of both landings was cut out to make a key for cement, to fill up the cavities that had been worn away, and there was a settlement in the wall over the right-hand landing.

A staircase of the construction I have described ought never to be permitted in a public building; and I consider that, sooner or later, this one would have given way under such a heavy traffic, even if the iron trellis had not been let into it.

Too much importance should not be attached to the steps breaking off about 5 inches from the wall at the places where the iron trellis was let into the stone. They broke at that part on the principle of what masons called 'coping a stone.' Nothing, in my opinion, could have prevented the staircase coming down, if the landing had broken.

The experiments I have tried show that a step, with a piece of stone let into the top on the usual plan, would have broken with the same weight upon it as broke a step with the trellis let in. If the steps had not been cut at that particular place they would have broken off close to the wall, instead of 5 inches from it. The effect of the cutting would be to accelerate the fall after the landing had broken. The experiments prove that the steps, as altered, would have borne a weight equal to four times what they were required to carry, provided the bottom had remained firm.

In 1837 Mr. Nurse erected the building, and shortly afterwards disposed of it to the Polytechnic Institution. The structure then consisted of the hall, staircase, and large room in the rear, with a small theatre over the Regent-street front.

In 1947 Mr. Nurse built the great theatre, and in the following year the official referees, under the Building Act (then in force), objected to the 'stairs and accesses' as insufficient. Subsequently, Mr. Nurse made a new staircase and entrance from Regent-street, but instead of uniting them with the Polytechnic, attached them to the building facing Regent-street, now in the occupation of the Cavendish Club. The whole traffic, therefore, of the building has been borne by the present staircases one of which has now given way.

The object of the referees with regard to public safety was in this manner entirely defeated. The then district surveyor committed a great oversight in not objecting to such an arrangement; but as he and Mr. Nurse are since dead, it is useless to comment upon their conduct. The Building Act then in force has since been repealed.

The entrances as now existing are not fireproof, as they are required to be both by the old and the present Building Act: for instance, the paving of the hall is supported on a wood flooring, and under it exists a perfect volcano of danger, comprising two steam-boilers and furnaces, a smiths' forge, a laboratory with about seven furnaces, a retort for making hydrogen gas, and two gasometers. It would be perfectly fearful to contemplate an explosion or fire in this part of the building, and consequent alarm with the Polytechnic full of people. The only exit would then be by a small door (usually kept locked) leading into the back of a house in Cavendish-square.

The directors will act wisely in remedying, as early as possible, this defect, by rendering the entrance-hall fireproof, or providing other means of exit.

This is not a singular instance in my knowledge of cutting off or otherwise appropriating means for exit from places of public resort, and within the last six months I have known instances of the exits being closed merely to avoid the expense of checktakers.

This shows the great necessity of periodical inspections of all places of public amusement.

The only inspection now exercised is that of the Lord Chamberlain, and this applies solely to theatres licensed for 'stage plays.' There is no provision made in the Act of Parliament for a professional survey, but, nevertheless, even by this imperfect supervision, many improvements in theatres have been effected, and probably many accidents prevented.

The buildings not licensed by the Lord Chamberlain are under the control of the county magistrates; but although the magistrates have a county surveyor, they do not insist upon an inspection by a surveyor at the granting of a license or at its renewal.

Buildings such as the Polytechnic not being intended for stage plays, music, or dancing, are under no supervision whatever, although they frequently contain as large a number of persons as many theatres.

All public places of amusement should be under a periodical inspection; and, during the hours that the doors are open to the public the police should have access, in order to regulate the mode of entry or exit, as abroad, where accidents are of much less frequent occurrence. Had this been the case, for instance, at the Victoria Theatre, the late catastrophe might have been avoided, and many lives saved.

The accident at the Polytechnic would have probably been prevented had the clause in the Building Act required notice to be given of all alterations in public buildings, without any exception whatever. This would doubtless

have led to a reconstruction of the staircases and landings, instead of attempting to repair what could never have been made good.

I am afraid I have but imperfectly, though conscientiously, fulfilled your directions, and I have only to express a hope that the jury will avail themselves of their privilege by making such a presentment to the Government, as will induce Parliament, early in the ensuing session, to consider and re-construct the present inefficient building clause, and the laws for the supervision of places for public amusement, so as to prevent, as far as practicable, a recurrence of those lamentable accidents which have been so frequent of late."

Mr. Christopher Eales, architect, appointed by the jury, afterwards read his report. After describing very minutely the construction of the staircase:—

"Each staircase is semi-circular on plan, and of geometrical construction. It is formed of Portland stone: each step is about 5 feet in length out of the wall, and is cut feather-edge, namely, being in the front 7 inches in depth, and at the back 1¼ inch, one end beng let into and secured to the wall. The landings were 4½ inches thick—the centre landings and steps being carried in each of the upper stories upon two cast-iron bearers secured to the walls, the whole being surrounded by a strong oak handrail, screwed upon a wrought-iron core, which is riveted upon stout cast-iron balustrades let into the steps, and secured with lead;"—

Mr. Eales went on to say:—

"Following out the theory of the principle of the construction of the staircases, I was led to carefully examine the landing, A, at the commencement of the second flight, which has been broken off at its greatest thickness, although a part of the front edge, where it had been thinned down to meet the first step, is also broken off, and shows a small horizontal vent in the fracture. It appears the third step above it had been broken some time, and was held together by two cramps. And I have also examined the piece of the upper landing, B, which has also been broken off (and from which it is stated the first indication of the handrail failing was observed), and in that portion remaining in the wall, I found it contained three defects in the vertical section of the stone, two of them so placed as nearly to touch at one extremity and embrace the whole depth of the stone. This landing, as I have already mentioned, had been cased with one of the iron trellis plates within 2 inches of its insertion into the wall, and also notched to the depth of 1 to 2¼ inches, for the reception of the iron bracket beneath the trellis. That this landing might fail at any moment may be readily conceived, having these concealed defects, and being without any assistance from the adjoining landing, by reason of the imperfect joint, and also without its proper bearing upon the step beneath, as well as being further weakened by having its surface sunk down and notched out so near to its bearing in the wall.

But assuming for the moment this piece of landing did fail first, it is difficult to account for the steps failing in consequence, because each step, when secured into the wall, is complete in itself, and as the landing would fall vertically, the action upon the steps could be only by the handrail dragging, and each step would be assisted by that beneath it, so that in that case the tendency would be for their ends to be fluted off at the insertion of the iron balusters, and so to relieve them of the burthen.

Upon the other hand, if we look to the state of the lower landing A, we find that where the first step fitted upon it, it had been reduced to about 1¼-inch in substance, and that for 16 inches of its width it had also been reduced from ¾ to 1¼-inch in depth at its junction with the wall; that at this corner, near the first step, it had a small horizontal defect; and further, the third step upward had been broken upon some previous occasion, and cramped together. And the steps generally had been sunk down to receive the iron trellis plates, and also notched for the brackets beneath, some within 4 inches, others 5 inches, of their bearing in the wall, all which had been done in an exceedingly careless manner, reducing their strength by one-half at the least.

Reverting, therefore, to the design and original construction of the staircases, those which are geometrical are always subject to vibration, and particularly so when cylindrical: in this case they are not only so, but they have not the advantage of being constructed, each in its entirety, within a surrounding wall, or commencing each flight from a solid base, but each is separated by a landing and steps carried upon iron bearers, fixed at the ends into the walls, so that the vibration is greatly increased; in addition to which they were, in my opinion, much too slight in their scantling for a building subject to so large a congregation of persons as this has been. Moreover, the pieces of landing forming the starting and finishing points of the upper flights were almost (in that of the one B entirely) dependant upon their fixing in the wall, so that when they became worn, and were cut as I have described, and considering the amount of vibration they were constantly subject to, any incipient injury that may have been done in the cutting, or defect in the stone, would be constantly developing itself by the traffic over it. I am therefore of opinion that the lower landing, A, failed by reason of its incapability to sustain the accumulated shock caused by the concussion of the persons descending the stairs, by which means each step, losing the support of that beneath it, readily broke off at the notching, and so brought about the catastrophe.

It appears these staircases have been loaded to a much greater extent since this casing operation was completed than was the case immediately preceding and at the time of the accident, hence that a seeming contradiction would arise as to the operation having had any undue effect; but it may have happened that the stone may have been overstrained upon some one of these occasions, and the fracture only awaited some leverage or concussion easily conveyed, even by an individual passing rapidly over it at the extremity next the handrail.

And that this is not hypothetical reasoning, it is only necessary to refer to the north staircase, where the first step above the landing ascending to the second story has very recently been broken through its whole thickness at the line of the notching for the reception of the iron trellis plate, the fracture being so minute that it is only to be found upon a very careful inspection, and the landing itself being also broken, and really held in its position by its tailing into the wall by one foot only of its length; so that, supposing it to have remained unnoticed, an accident might have happened as unforeseen as that upon the south side, although large numbers of persons may have passed safely over it up to the time.

And, further, a general question arises out of this and other unfortunate accidents, as to the safety of the public in attending places of resort where large numbers may congregate upon the stairs. I think, as a rule, cylindrical staircases, having open well-holes, together with a great width of step, supported only at one end by insertion into the wall, are greatly to be condemned, as highly dangerous; but where such are constructed, a support at the ends of the steps should be imperatively required, having its bearing upon columns raised from the ground, by which means, if properly connected to the wall, the handrail may also be efficiently secured, and stone landings should in no case be employed without having direct support at both ends."

The Coroner expressed his approbation of the reports, and adjourned the inquiry until Monday next, when he will go over the evidence, and the jury will give their verdict. We must be permitted to say that, surely two o'clock, and on the previous occasion, three o'clock in the afternoon is too late in the day to commence proceedings, the result being the necessity for adjournments, great inconvenience to those who are attending against their will, cost to those who are forced to have representatives present, and in such a case as this great injury to the Institution, already sufficiently damaged.

THE ACCIDENTS AT LIVERPOOL.

THE dust from the accident in Great George-street, Liverpool, had hardly cleared away, when another accident of an almost similar character occurred in Tithebarn-street, of the same town. It is of the evidence given at the inquests on the dead in these two instances that we have here to speak. The accident in Tithebarn-street, however, was not so fatal as that in Great George-street. We last week gave some account of the latter. The inquest in that case took place on Thursday in last week. The chief evidence was that of Mr. James Newlands, the borough engineer, and Mr. William Rishton, the building surveyor to the corporation. The shop proprietor, Mr. Lewis, and Wm. Roberts, a labourer, as well as others, were examined.

Mr. Newlands said;—On examining the condition of the central partition, I found that, although 9 inches thick, it in reality consisted of two 4½-inch brick walls, not at all connected, and each having a chimney-breast. I found on the upper floor—on the floor adjoining that which gave way—a great quantity of bricks and rubbish, threatening the same accident to the south side of the shop as had happened at the north side. I recommended that they should be immediately cleared away. Mr. Rishton came, and I resigned the matter into his hands, as being the competent authority. Since the occurrence I have made a careful examination of the premises. The proximate cause was the loading the floor with bricks. The thin wall had evidently buckled by the yielding of the joists; and the swaying of the chimney-breast hastened its fall. Unless precautions were taken, the taking down of this wall would be a very dangerous work. I have heard the evidence given as to what men were employed: they certainly were not the proper sort of men to be employed in such work. If all were of the same character as the two described, they were wholly unfit. Work of this kind would require the attention of men accustomed to it—a regular contractor, in fact, or one possessing the same knowledge as a contractor.

Mr. Rishton said;—I have made a careful survey of the ruins. I have heard the evidence of Mr. Newlands. I agree with his opinion, generally, as to the proximate cause of the accident. I have heard the evidence of Mr. Lewis, and the orders given by him in reference to the taking down of the wall. Looking at the nature of the work and the order given, I think he used reasonable care and precaution; for, if the order had been attended to, this accident probably would not have occurred. The only objection I should have to his orders is, that the bricks were to be placed on another floor. A practical man would have used greater precaution in taking down the wall: the weight of the bricks on the floor must have been enormous. There is no question of the imprudence of the manner in which the work was done. A gentleman from my office visited the place from time to time officially; and I never had any complaint: I must do Mr. Lewis the justice to say, that he often came to me for advice, and seemed most anxious.

Mr. Nicholl examined.—I am a builder. I have heard the evidence given by Mr. Newlands and Mr. Rishton. I agree with Mr. Newlands as to the proximate cause of accident; and I agree with Mr. Rishton, that, if Mr. Lewis gave the orders represented, he took due care and precaution.

The jury having retired and consulted together, the foreman announced the verdict of twelve out of sixteen to be "Death by misadventure; with great blame to Mr. Lewis for not having engaged competent workmen." The four jurors were of opinion that Mr. Lewis was not blameable.

It was on the day following this inquest that the Tithebarn-street accident occurred.

The public-house of Mr. Lumb, opposite the railway station, had been undergoing repairs, with a view of forming the premises into an hotel. While labourers were engaged in taking down the roof, the joists supporting the ceiling of the top story gave way, and this falling, carried with it the second and first floors to the cellar. One poor man was carried down with the ruins and killed on the spot; and another, who fell with him, was so severely injured that little hopes are entertained of his recovery. Several other men were engaged on the premises at the time, and their escape was marvellous.

At the inquest, James Eyre, the first witness, said;—I am a joiner and builder. On the 22nd of September last I entered into a contract with Mr. Lumb, to pull down a house and shop in Tithebarn-street, according to plans prepared by Mr. Ellison, architect. Hr. Hughes contracted with me to take down the brickwork: he is a bricklayer by trade. He employed his own men in that department; and I had a foreman and one other man there to take down the timbers and do other things which might be required. On Wednesday evening, having heard of the accident in Great George-street, I went to Tithebarn-street, and told the men to be very careful: I had no occasion to find fault with them, and they seemed to pay attention to what I said. About a quarter past ten yesterday morning, on getting to Tithebarn-street, I saw a lot of timbers in the street, and I found the flooring had given way and fallen down into the cellar of the building. Four of the floors had come down. I inquired whether the men had been overloading the floors with bricks, and was informed that they had not. I think the cause of the falling was that the joists had never gone a proper distance into the wall; but the fact could not have been discovered before we commenced operations. Some of the joists had nothing but the plaster underneath, and the others were only put about an inch into the wall. I think the joists must have broken in the falling down. I was told the man stepped off the wall he was pulling down: he went on the edge of a brick, and it threw him down on the floor. I think that forced the ceiling through. I am sure that would be the cause, considering the rotten state of the timber. The only wonder was, that a person could walk across the floor without bringing it all down.

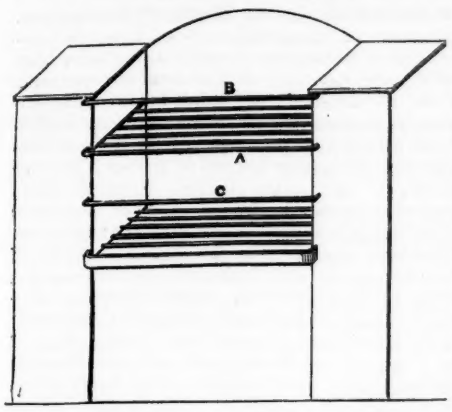
Mr. Rishton said,—I heard yesterday morning of this accident, and went immediately to this spot. I have made a careful examination of the ruins. In examining the joists, and balks, and planks, I found them to be very much decayed indeed; and I am very much surprised that so much of the building above this floor should have been taken down and removed without an accident. From the continual swagging of the floors, the joists, at first not deep, seem to have been pressed almost entirely out, and lost all hold of the walls, or nearly so; and the wall next Stephen's-lane had receded from the inside. The floors should have been propped from the basement upwards in this case. It appears to be the custom not to prop floors; but I think the floors should be examined before the work is commenced. I have nothing to do with pulling down buildings: we have no power in that respect. In this instance the state of the joists could have been ascertained before the work commenced, and should have been, as it was a very old building.

The jury returned the following verdict:—"We find the cause of death to be accidental, but arising from negligence on the part of the contractor." In a previous form of the verdict they had given it as their opinion that "the building surveyor had not sufficient powers in the superintendence of the taking down of old houses."

THE NEW PUBLIC OFFICES, WILLENHALL, ON FIRE.—During the sitting of the Police-court a jet of flame burst out from the edge of the skirting, near the fireplace. The prompt application of a few buckets of water, however, extinguished it. An examination of the place afterwards showed that the fire had been occasioned by the kindling of a beam, which the carelessness of the builder had allowed to project into the flue. It is well that it broke out at the time it did, for had the room been locked up, the mischief might have spread, and the lives of the prisoners in the cells underneath been sacrificed.

PATENT FOR ECONOMISING FUEL AND CONSUMING SMOKE.

AN invention, with these ends in view, has been recently patented by Dr. Bartlett, of King's-road, Bedford-row. The principle of its action will be seen on referring to the following diagram of a



grate, to which the patent has been applied. It shows that a horizontal grating, A, divides the fireplace into two compartments, B and C; and the fire-bars of the lower compartment, C, are made to move, so that coals may be readily introduced into that part of the fireplace. The fire is lighted in the upper compartment, B, and after it has burnt up, the lower compartment, C, is opened by moving its fire-bars, and fuel is readily introduced by an ordinary fire-shovel into the lower compartment. When the fire needs to be replenished the lower compartment, C, is opened, the well ignited fuel is removed by the aid of a shovel, from the lower to the upper compartment; and the lower compartment is then again supplied with fresh coal. By making a side hopper, or fuel chamber, the fuel is readily introduced from the top, and in that case the fire-bars need no alteration. Dr. Bartlett asserts that his invention saves 50 per cent. of coals, because the smoke is burnt instead of being wasted; that it can be fitted to any stove, fireplace, or furnace, at a trifling expense without altering its appearance; and that, by reason of the economy of fuel, fires made in the patent grates last much longer than any other, and therefore require attention much less frequently.

HANTS COTTAGE IMPROVEMENT SOCIETY.

IT is proposed to establish a society in Hants for the purpose of assisting owners of cottages in which the tenant has a family of children and only two sleeping-rooms, to add a third. For this purpose each member is to subscribe annually 1*l.*; and a subscriber of 5*l.* is to be allowed to select cottage in his district, and also to be allowed to offer the owner 5*l.* on condition that he agrees to supply the additional means required for the improvement of his property by erecting a third sleeping-room attached to the cottage, it having been ascertained that the total expense need not exceed 10*l.* It is stipulated that such cottage be *not* the property of the subscriber, nor one built after the formation of this society. Further, a subscriber of and above 1*l.* is to be allowed to give that sum for the purpose of dividing any room which may be large enough, occupied by children, either in towns or villages, the expense of which, as estimated by a Hampshire architect, need not exceed that sum.

The mode adopted is wrong in principle; but the evil sought to be remedied is so large and crying that we must accept any attempt to lessen it.

IMPROVEMENT OF ST. PAUL'S CATHEDRAL.

THE Bishop of London has made a second appeal for funds for adapting St. Paul's for public service and attempting its decoration: 5,200*l.* have been subscribed, but 4,000*l.* of it have been already expended. The committee state—

1. That thirteen of Gurney's patent stoves have been placed in the crypt and underlying the nave and choir, and that for the supply of these a vast quantity of coke is required day and night during the week days, with a larger consumption on Saturday and Sunday.

2. In order to maintain an equal temperature at a diminished permanent cost throughout the year, it will be necessary to double-glaze all the windows of the cathedral, which will answer the purpose of at once excluding both external noise and external cold, and may facilitate the introduction of painted glass of an appropriate character.

3. The lighting the corona of the dome with jets of gas cannot be continued at less expense than 1*l.* per hour.

4. It is calculated that in order to adapt the organ to the twofold use of the daily worship in the choir, and the special services under the dome, an additional outlay of at least 1,000*l.* is needed, for which a separate subscription has been commenced.

5. Other particulars which deserve attention are the erection of a more suitable lectern and reading-desk, the supply of thick heavy curtains at north, south, and west doors, to keep out draughts of wind from these quarters, and the completion of the screens, which at present are in only a temporary and unfinished state.

When some time ago we noted the preparations for the services, we said the pulpit was at the east end of the nave. It was then only in course of construction; and it may be well now to say that it is set up on the south side of the area covered by the dome. Let us add that all the arrangements have been made under the able direction of Mr. Penrose, architect, and have given great satisfaction.

THE "BUILDER'S" LAW NOTES.

Turnpike-road.—The appointment by Act of Parliament of trustees to manage a turnpike-road which previously existed as a highway, does not take away the right to the soil of the turnpike-road from the owner of the land on the side of the road.—*The Marquis of Salisbury* v. *Great Northern Railway Company.*

Railway Company.—A company having compulsory powers to take land necessary for the purposes of the railway, agreed with a person for the purchase of a right to take the surface-soil. Subsequently they preferred the fee-simple, and served notice that they would take it; but they were restrained by injunction from doing so, as the fee-simple was not necessary to the making and maintaining of the railway.—*Eversfield* v. *Mid-Sussex Railway Company.*

Policy of Assurance.—The Court of Appeal has held (reversing the judgment of the Queen's Bench) that a policy the annual premium on which was made payable quarterly, is, in fact, an annual assurance, but with time given to pay the premium by four instalments instead of in one sum, and that the payment of this quarterly portion in advance is not a condition precedent.—*Sheridan* v. *The Phœnix Life Assurance Company.*

Poor-rates.—The Court of Error has held that the Poor Law Commissioners have no power to make any rules or orders authorising the making of a poor-rate (in its nature retrospective) for the payment of past debts.—*Waddington* v. *City of London Union.*

VENTILATION OF HOUSE DRAINS AND TRAPPING OF GULLIES.

A REPORT to the Hackney District Board of Works, by Mr. James Lovegrove, surveyor of sewers, has been printed, from which we make the following extract:—

"With proper appliances the gaseous currents in drains may be controlled and turned either into the sewer or above the houses, by means of the water discharged into the drain, and the variable temperature of its gaseous contents, as opposed to that of the atmosphere. To effect the object in view, I first fix at any point in the line of drain between the outlet and the first branch drain a double valved syphon trap, consisting of a nicely fitted valve which shall shut off the foul air from the sewer during all states of the atmosphere, and behind this a syphon dip, for the purpose of preventing the escape of foul air through the upper part of the valve during the period of flow. Over this valve, and also forming a passage over the dip, is placed a tube and light air valve, which, on the slightest pressure from within the drains, shall open and discharge air only into the sewer; then, at the several inlets, are fixed valves to work freely, with syphons behind them, so as to act entirely independent of water, the syphon being required only during the period of flow: lastly, near to the extremity of the drain, is placed a light air valve, which opens on the slightest pressure from without, and supplies fresh air into the drain. The action of a drain thus constructed would be as follows:—Every time water is discharged into the drain a bulk of air, nearly equal to the quantity of water so discharged, would be expelled through the light air valve at the outlet into the sewer, and, as the water flows into the sewer, it would be followed by an equal bulk of fresh air passing through the light air valve at the extremity of the drain: a similar action would also be obtained by the variation of temperature. Now, by comparing the action of the two modes herein described, we see the one is directly the reverse of the other: the effect of the first is the nearly constant discharge of foul air into the houses, and the second the constant supply of fresh air through the drain into the sewer. By applying the same principles proposed for house drains to gullies, it is not possible for the foul air to escape, and they are made to supply fresh air into the sewers."

Mr. Lovegroves's report is accompanied by diagrams of his mode of ventilation and of trapping. He recommends that the foul air should be allowed to escape only at the top of ventilating shafts, removed as far as possible from breathing point.

PRIZES AWARDED BY THE COMMITTEE OF ARCHITECTURAL MUSEUM.

AT the meeting on Wednesday, Mr. A. B. Hope stated that the premium of 5*l.* offered by the Ecclesiological Society for a coloured panel had been awarded to Mr. A. O. P. Harrison. One of the panels showing considerable ability (mentioned by us as the most harmonious, though less clever than one,—the specimen rewarded), had been tampered with, Mr. Hope said, by being cut away to give greater relief, which would have prevented the committee from awarding a prize to it, even if it had been the best. The specimens submitted in competition for the prizes offered for wood-carving, and for drawings from casts in the Museum, were not considered up to the mark; but a modified premium of three guineas was awarded to Mr. John Chapman, for panels, and Mr. Edmund Edgar Kirby, for drawings. The prize for modelling was awarded to Mr. Doel.

BOARDS OF HEALTH.—LAYING OUT LAND.

A FEW weeks since, a tabular statement of the "resident engineers'" salaries was half promised: add, if you please, "capabilities." You can a tale unfold,—so can I, having had twenty-five years' continued practice. An adventure amongst drainage errors occurred at Fleetwood, where a linen-draper was engaged at two guineas per week to conduct the laying down and the completion of the town's drainage. Two-thirds in length of the work were laid, when it was discovered that the pipes were all laid at a parallel distance from the surface by means of a 4-feet staff, in one instance having a reverse fall of 10 inches in 18 yards. The whole was taken up at no trifling cost, and relaid.

By comparing Messrs. C. Knight and Co.'s Board of Health Almanacks for 1858 and 1859, it will be seen that 13 per cent. of the "resident engineers" are changed: how filled up, goodness knows (Mr. A. L. Dickens can vouch for strange proceedings, and more strange condition of some public works). Rugby and Accrington have appointed their collectors "resident engineers," and, may be, others likewise. When a vacancy lately occurred at Rochdale, six were selected from thirty-six to go to ballot. Four of the six were from a surveyor's office in one of the principal seaports in Lancashire. The higher the douceur from assistant to a certain officer, the higher the testimonial with the borough arms upon the face of it! So one of them informed me. Strange doings, Mr. *Builder!*—no doubt you know enough.

We want correct formulæ for the flow of *sewage*, not water.

I have used Etelevein's and Leslie's of late. As to a sewer I am at present running according to said formulæ, a 15-inch cir. 1 in 17 fall, will drain 16·37 acres, the area to be drained being 10·30 acres. Mr. Roe's table shows that a 15-inch cir. falling 1 in 60, will drain 10 acres—capacity varying direct as the quantity and inversely at the fall.

An article probably would not be out of place upon the necessity of laying out building plots in such manner that sanitary works might be effected in a proper way, and at a cheap cost. In my district I have to contend with building plots on lease, 30, 40, and even 50 yards back, for common cottages, bounded on two sides with say 12 and 14 yard streets, which plots are built up on the two fronts, leaving a 4-feet opening in one corner, through which all filth, ashes, &c. have to be conveyed for some 40 yards, placed on the surface of the street till carted off; whereas a building plot of 36 or 44 yards wide, having a

five yards' accommodation street through from cross street to cross street along the centre, containing the sewer and dust-hole openings, is what ought to be. I presume estate agents or their surveyors ought to see the necessity of changing such totally absurd and almost cruel methods of laying out land, thereby preventing close courts, heaps of filth and offensive buildings, improved drying-ground, large yards in every conceivable shape, the house drains having to be collected and brought through the 4-feet passage, or under a dwelling. A TOWN SURVEYOR.

INSTITUTION OF CIVIL ENGINEERS OF IRELAND.

ONE of the usual monthly meetings of this institution occurred on last Tuesday evening, Mr. M. B. Mullins, President, taking the chair.

The secretary, in the absence of the author, Mr. John W. Kelly, of Ennis, read the paper for the evening, the subject being, "The Causes of Failure of Bridges on Mountain Rivers," commencing with an allusion to the importance of the subject, arising from the frequency with which such failures are heard of, and the inconvenience and expenditure they occasion; and after a reference to the wide-spread damage in this respect which had been caused in the mountainous parts of the counties of Kerry, Mayo, &c. by the floods which occurred in September last, the paper proceeded to set forth a principle in connection with bridge structures, which, simple though it was, in the opinion of the author, was sufficient in many cases to prevent such casualties—this principle being, that the channel, or waterway, for some short distance above, through, and below the bridge, should be of equal discharging capacity, and that the channel below should on no account be of greatar waterway or discharging capacity than the arch or arches of the bridge. To the great head of water above, and sudden fall through or at the down-stream face of the bridge the damage was attributable; and the object to be attained should be to convey the floods through and for some distance below the bridge in a comparatively moderate incline and velocity, which Mr. Kelly submitted would be done by regulating the discharging power of the channel, &c. in the manner he recommended.

NOTES FROM IRELAND.

THE Dundalk and Enniskillen Railway is so far completed as to admit of its being opened for public traffic on the 1st of February, after the Government inspector shall have gone over it.

The Council Chamber in the City-hall, Dublin, is to be acoustically improved at a cost of 200*l.*; and a premium of 20*l.* (at a rate of 10 per cent. on the outlay) is proposed to be given for the best plan. The adjudicators are to be the ex-Lord Mayors of Dublin since 1850. This arrangement was proposed as an amendment to the original intention of leaving it to the decision of No. 1 committee, on which are some practical and experienced men, and its prudence appears somewhat questionable, as the attainment of the object in view may not now prove an easy matter.

Turkish baths are being introduced into Ireland, at Bray, county Wicklow, after a plan originally suggested by Mr. Barter, of Cork.

A monument is about to be erected in St. Nicholas Church, Dundalk, in honour of Burns's eldest sister, Mrs. Gall.

The gas companies in Dublin have reduced their price to 4s. 9d. per 1,000 cubic feet. An opposition company, entitled "The Independent Gas Consumers' Company," has been started, and the requisite buildings are being commenced. It professes to supply better gas at 3s. 6d. per 1,000 cubic feet, free from meter rent, and thereby save the consumers 50,000*l.* per annum. Mr. Flintoff is the promoter and secretary.

In addition to the improvements recently made in Belfast, we have to record the erection of a block of buildings in Donegal-street, for Messrs. Philip Johnson and Son, an eminent mercantile firm.

A new station for the Ulster Railway Company has been erected at Killylea, in county Armagh. It is of brickwork, with some novel architectural features, and in length about 50 feet.

It is proposed to erect a new Roman Catholic Church at Crossmolyon, according to plans furnished by Mr. Canning, of Ballina. The design displays a cruciform plan, with nave, transepts, chancel, sacristy, and tower and spire at west gable; an open timber roof, stained and varnished; and the total dimensions are about 110 feet by 30 feet. The style is Gothic, but of plain character; material, rubble limestone, with chiselled dressings. Expenditure, including tower and spire, about 2,000*l.*

Some works are being executed at St. Patrick's Cathedral, Dublin, a portion of which is in a very tottering condition.

The new and small church recently erected at Attea, county Limerick, by the Venerable Archdeacon Goold, has been opened. It has nave, vestry, porch, belfry on west gable, traceried windows, open-stained roof and benches, and a triple stained-glass window in the east gable. The interior (we believe) does not exceed 30 feet in length; and the cost of erection was about 600*l.* Mr. W. Fogerty, architect.

The church of St. James, at Dublin, is to be rebuilt according to designs by the Ecclesiastical Commissioners' architect; and the interior of Rathconnell Church, county Westmeath, is to be newly fitted and furnished.

A branch line from Shantonagh to Cootehill, is about to be constructed; and contracts are invited by the Dundalk and Enniskillen Railway Company. The Limerick and Castleconnell Railway Company propose to proceed with the formation of the line from Castleconnell to Killaloe.

A new chapel school is to be built at Newbridge Barracks, county Kildare, stated to be one of the finest and best arranged barracks in the United Kingdom.

The Moore testimonial, at Dublin, is now being removed *in toto*: the pedestal is to be erected after a more appropriate and ornamental design, and the statue remodelled (as the local journals have it) "not being in accordance with the views of the sculptor."

CHURCH-BUILDING NEWS.

Poplar.—The new Baptist Chapel and Sunday Schools, erected in Manor-street, have been opened. The chapel will accommodate 400 persons, without galleries. It is in the Pointed style, with open timber hammer-beam roof, 45 feet span, stained and varnished. The schools are under the chapel, and will accommodate about 200 children. The vestries are in the rear of the schools. The cost is about 1,200*l.* Messrs. Morris and Son were the architects, and Mr. J. Salt, the builder.

Deptford.—A new Baptist Chapel and schools are proposed to be erected at the junction of the Old and New roads, opposite the toll-gate. The style to be Pointed, of white Suffolk brick, with malm-brick buttresses, and coloured-brick arches and string courses. Messrs. Morris and Son, of Poplar, are the architects.

Winston.—The church here, which for years has been in a most dilapidated state, has undergone a substantial restoration, internally and externally, and was reopened for Divine service on the 17th December last. For the attainment of this desirable object, it is gratifying to report that the landed proprietors and ratepayers readily and liberally responded. The builder employed was Mr. Francis Betts, of Stourmarket.

Diss.—On the 6th inst. the parish church of Mellis was opened for Divine service, after having been closed for more than twelve months, in consequence of the dangerous state of the roof, and the repairs which had become necessary. The church consists of a south porch, a nave, chancel, and vestry: the tower has long fallen, and the east end is unsightly from having been rebuilt by a former incumbent with red brick. The nave windows have been thoroughly cleaned, the stonework made good, the glass renewed, the walls scaled and stuccoed, and the floor repaved. In the interior the font has been reworked; the screen, which some former churchwarden had removed and mutilated, restored and replaced under the chancel arch; the door arches cleaned and repaired, and new oak doors, with appropriate hinges, handles, and locks, fitted to them. The whole interior fittings have been removed, the old oak benches reworked, and the area fitted up with oak benches, having carved poppy-heads corresponding with the old ones; and a new oak pulpit and reading-desk. The roof of the nave has been restored with English oak, according to its original design, and covered externally with Westmoreland slate. The chancel and its appendant vestry also have been restored, an east window being inserted in the place of the old nondescript brick mullioned one, the walls restuccoed, the unsightly pews cleared out, and the space filled up with oak benches. The porch has been partially restored. All the works have been carried out in accordance with the plans and under the superintendence of Mr. Johnson, of Bury St. Edmund's, architect, by Messrs. Godbolt, of Brockdish, builders; the stonework being executed by Mr. William Vine, of Diss, stonemason. The cost already incurred is considerable: the ratepayers have been at the expense of restoring the roof; and a fund has been raised by the rector to defray the remainder of the outlay.

Buckingham.—Addington church has been restored and reopened. All but the ancient tower has been rebuilt, by Mr. Tibbits, of Buckingham. The body of the building is of freestone, surmounted with crosses; Ancaster stone being used for all the dressings: all the seats are open, and of oak, unvarnished; the pulpit being of the like material, and carved. The interior of the roof is of oak carved work and tracery, whilst the corbels are carved in various devices of flowers; and the flooring is laid with Minton's encaustic tiles, variously decorated. The font is of Mansfield stone, the lid surmounted with wrought ironwork of artistic design. The altar-piece consists of alabaster, inlaid with Italian variegated marble; whilst all the windows are of stained glass, into which is inserted scriptural pieces in like material, which have been gathered from various parts of the Continent by Mr. Hubbard; but the chancel window remains to be completed, the present being but a temporary substitute.

ARCHITECTS' CHARGES.

QUANTITIES AND TENDERS.

SIR,—I beg to enclose you instructions to competitors, received for Codnor Schools, Derbyshire, by which you will see that, besides endeavouring to obtain 2½ per cent. as a builder's surveyor in making out tenders (for the whole of them, no doubt, if required),* a charge of 2½ *per cent.* is made for quantities, and 10*l.* for a copy of the drawings. Supposing an outlay of 1,000*l.* for example, the per-centage will be rather high, according to the above scale of professional charges. We will suppose six competitors, when we shall have it thus:—

Usual charge for drawings, specifications, and superintendence, at 5 per cent	£50	0	0
Quantities, at 2½ per cent.	25	0	0
Furnishing drawings	10	0	0
Making up tender for successful competitor, at 2½ per cent.	25	0	0
Do. for say five unsuccessful do. at 15s.	3	15	0
Six forms of tender, at 5s.	1	10	0
	£115	5	0

being nearly 12 per cent. upon the outlay, the whole of which must, in one form or another, be drained from the pockets of the proprietor. Do pray, Mr. Editor, justify the honour of our profession by speaking out plainly against such ways of money getting.† AN ARCHITECT.

*** We insert this letter because the papers sent up seem to justify the writer's statement, but we are disposed to hope that what would appear to be set forth in the "Specification," and in the "Instructions to Competitors," is not what is really intended.—ED.

COMPETITIONS.

Hanley Cemetery.—The first premium for buildings has been awarded to Messrs. Ward and Son, architects, Hanley; the second, to Messrs. Bellamy and Hardy, architects, Lincoln. The first for laying out grounds, to Messrs. Bellamy and Hardy; the second, to "Hortus," Coventry.

Middlewich Cemetery.—The premium for buildings has been awarded to Messrs. Bellamy and Hardy.

PROPOSED COMPLETION OF THE CENTRAL TOWER OF BAYEUX CATHEDRAL.

WE have received from Normandy an announcement, which may be seen at our office, that the French Society of Archæology desire to obtain designs in competition for the termination of the central tower of Bayeux Cathedral. The designs are to be sent to M. Gangain, 3, Rue de la Marine, Caen, before the 15th of March next. Medals of gold, silver, and bronze, are offered for selected designs, but nothing is said as to carrying out the design. A wood-cut on the programme, repre-

* "Every information required upon any one query will be given, upon application to the architect, who also is willing to prepare your tender for these works, at the following charges, viz. 15s. if not successful, and 2½ per cent. upon the amount of your tender if it be accepted."

† We see that the tenders for the schools with teachers' residence, were opened on the 3rd instant, and were found to be as follow:—Lilly and Smith, Measham, 1,089*l.* 9s. 3d.; Gun, London, 949*l.* 10s.; Pickard, 910*l.* 9s.; Morris, Long Eaton, 897*l.* 10s.; Thompson, Derby, 882*l.*; Wright, Loscoe, 865*l.* 17s. 6d.; Palmer, Lowdham, 865*l.* 10s.; Moore, Derby, 859*l.*; W. Bridgart, Derby (accepted), 850*l.*

senting the tower as "primitively" terminated (?), shows an Italian cupola and lantern on top of the now existing octagon Gothic lantern. The instructions include the following announcement,—"The Society leave competitors entire liberty in the choice of style!"

THE GOVERNMENT SCHOOL OF MINES.

SIR,—In the few lines with which you preface the notice of my lecture in your Journal for last week, there is an error for which I am responsible, as I observe that you have merely copied a phrase in my private note to yourself.

When I wrote that note I was fully under the impression that the nominal "registration fee" of sixpence for each course of lectures, which each working man pays, went directly to the Government. I find, however, that this is not, and never has been the case.

Originally, the sum in question, which amounts to about 15*l.* for each course, was wholly consumed in paying the attendants, who were of course detained beyond their regular hours on the evenings of their lectures, and in advertising the courses.

More recently, however, the Government has undertaken to meet both these expenses, and consequently the registration fees are paid in to the general account of the professors, and are only subject to the deduction which the Government makes from all fees.

The result is, that at present each of us receives about 5*l.* 10s. per annum as his share of the profits upon the working men's lectures.

I may, perhaps, be excused for having forgotten this addition to my income, and for saying that we derived no profit, direct or indirect, from the lectures.

My motive in mentioning the matter at all was simply that you, as editor of the *Builder*, might understand that I could not possibly have any unworthy motive in asking you to spread more widely a knowledge of the existence of these lectures. It really did not occur to me that you would publish the information.

I have troubled you with this long explanation about a small matter, partly because it is desirable to set all mistakes right, but more particularly because some of the working men, struck by the statement to which I have referred, have proposed to meet and present us with a testimonial, in compensation of what seems to them an injustice.

Although the circumstance that such a design has been in contemplation is necessarily very gratifying to my colleagues and myself, I trust I need hardly say that we earnestly deprecate the carrying it into execution. The delivery of the lectures is simply a part of our duty, and we neither seek nor could possibly accept any reward beyond that good will and respect of our audiences with which we have hitherto always met.

THOMAS H. HUXLEY, F.R.S.
Professor of Natural History.

Books Received.

VARIORUM.

"HAND-SHADOWS to be thrown upon the Wall," by Henry Bursill (published by Griffith and Farran, St. Paul's-churchyard), is the title of an amusing little book, the intention of which it explains. We all know the rabbit on the wall, formed with the fingers before a light, and Mr. Bursill now shows how a goose, a deer, a black man's head, a tortoise, a pig, and half a dozen other individuals, may be produced in like manner. The position of the fingers is drawn with care, and the result, irrespective of the fun to be got out of the transference to the wall, is a series of amusing and artistic prints.——The *Edinburgh* contains a well-written eulogy of the present condition of the library of the British Museum, which is fast becoming, even if not so now, the first in the world; and an elaborate paper on those marvellous storehouses of antiquity, not yet properly examined, the Roman catacombs. It has been asserted that there are sixty different catacombs on different sides of Rome. Part of one has been measured, and *if* this be a fair specimen of the rest (it is smaller than some), there are in the whole together 900 miles of streets of the dead, and, according to one calculation, 7,000,000 of graves. Deceits practised by men belonging to the Romish Church have thrown doubt upon whatever has been found here. It is much to be desired that the early Christian memorials in these catacombs should be brought back to a true standard of accurate research. The cost of a joint commission of proper persons, deputed and paid by the Christian nations of the world, would be money well spent.——"The Topography and Climate of Apsley Guise, in reference to their Influence upon Health and Disease, as compared with celebrated English and Foreign Localities. By James Williams, M.D. with Remarks on the Hygienic Treatment of Consumption," &c. (Richards, Great Queen-street) gives an account of what must be a very healthy locality, if that which is said as to the average mortality (17 per 1,000) be correct; but the pamphlet bears too much the aspect of a medical man seeking to attract patients to the district in which he practises. Nevertheless the purpose appears to be a fair enough one, to draw the attention of consumptive and other invalids to a locality (in Bedfordshire) from a residence in which they may gain much benefit as well as the doctor. The want of houses here is said to offer a good opportunity to builders.

Miscellanea.

ART UNION OF LONDON.—We would draw attention to the advertisement of this important institution in our present number, and will find an early opportunity to speak of the fine print, worth double the subscription, which each member will receive, irrespective of prizes.

CHURCH ARCHITECTURE: LECTURE AT HAREWOOD.—The Hon. and Rev. James Lascelles, rector of Goldsbro', has given a lecture to the members of the Harewood Literary and Scientific Institution, "On Architecture as exemplified in our Parish Churches." The lecturer traced the gradual rise of architecture in this country, explaining the Roman, Saxon, Norman, and successive grades of the Gothic style, and pointed out the distinctive features of each. Certain simple rules were laid down respecting the pillar, capital, arch, and window, which would enable most persons to arrive at something like a correct idea of any old church. It was a very instructive lecture, says the *Leeds Intelligencer*, and was listened to and appreciated by a numerous audience.

BARRACKS AND CAMPS.—General improvements are to be effected at St. Mary's Barracks, Chatham, in order to promote the comfort of the invalid troops by whom these barracks are almost exclusively occupied.——It is evident to all who visit Aldershott at this season of the year, says the *Hampshire Independent*, that it is high time the Board of Health had commenced operations. Drainage there is none. The streets, if they may be so called, are one vast "midden hole." Pedestrians have, in some places, to flounder through 6, 8, and 10 inches deep of a composition which would defy description; in addition to which, in dark nights, unless you keep the middle of the mud (we cannot call it road), you are in danger of life or limb by falling into some of the numerous pitfalls. People it seems have received injuries, and in one case a soldier was killed near this spot.——Tenders for the erection, at the Winchester garrison, of barracks for married soldiers, as well as a laundry, will be received at Pall-mall, on the 24th. The new buildings will be placed partly on a piece of land abutting on St. James's-lane. They will be commenced in the spring.——From a paper on the sanitary statistics of India, in the *Times*, it appears that the annual rate of mortality in hospital, from all causes, among the men of her Majesty's and the Company's European forces, amounts to 63 to 1,000. This is a dark picture, for in Liverpool, England's most unhealthy city, the mortality is *only* 33 in 1,000. From statements adduced by Sir A. Tulloch, it further appears that the annual rates of mortality in and out of hospital to the effective strength of Queen's troops in India were 59 per 1,000 for Madras, 61 for Bombay, and 75 for Bengal, or a mean mortality of 65 per 1,000 for the three Presidencies. The mortality of the officers contrasts singularly and favourably with the above, for the average deaths of officers serving with European corps in Bengal, for the eight years ending 1854, were at the rate of only 21 per 1,000. Comparing the military and civil services, we find that the present mortality of Bengal civilians is only 18 per 1,000.

AUTHORS OF THE AGE.—Our readers will thank us for drawing their special attention to the fact that Mr. S. C. Hall, F.S.A. will give his two lectures on "Great Men and Women of the Epoch," of which we have already spoken, at Willis's Rooms, King-street, St. James's, the first on Friday, the 28th instant, and the last on Friday, the 4th proximo, at eight o'clock, p.m. The first will refer to Hannah More, Scott, Rogers, Crabbe, Moore, Miss Landon (L. E. L.), Sydney Smith, Wordsworth, Coleridge, and others. Surely, if the Londoners flock in thousands to a self-designated humbug, to hear him tell how he takes in the public, they will not fail to go to an honest literary man of note, and hear his discriminating and interesting account of kindred spirits with whom he has associated.

PROPOSED EXTENSION OF THE LIVERPOOL DOCKS.—The new Liverpool Dock Board resolved, at a special meeting on Saturday, to apply to Parliament for powers to borrow 300,000*l.* for the purpose of improving and extending the Liverpool Docks. There was a lengthy discussion, and the proposition was carried by 15 to 6. The chairman stated, as an evidence of the satisfactory condition of the estate, that the receipts of the Board for 1858 had exceeded those of 1857 by 500*l.* though the returns in 1857 were greater than had previously been experienced.

WATER SUPPLY TO LANCASTER LUNATIC ASYLUM.—An instructive report on the past and present water supply of Lancaster Lunatic Asylum, by the architect, Mr. Edmund Sharpe, has been made to the visiting justices, and printed. Works have been lately done at a cost of 106*l.* odds, for the complete supply of the inmates. The quantity of water pumped by the engine daily is 30,000 gallons, at 3½d. per 1,000 gallons. The water has been analyzed by Dr. Angus Smith, and declared to be satisfactory. In the former supply, the pipes (2½ inch) delivered thirty-two gallons a minute; but in a few years only delivered twenty gallons, and it was found that this arose from oxidation. The pipes were taken up, exposed to heat, and brushed interiorly with a metallic brush, when the corrosion was removed, and the pipes were found to be little the worse. Mr. Sharpe advises that when new pipes are laid, as from the purity of the water and the consequent corrosion they must eventually be, the interior should be lined or lacquered with asphalte.

THE WORCESTER SCHOOL OF ART.—At the seventh annual meeting of the Worcester School of Art, it was stated that 283 students had received instruction during the past year, being less by thirteen than the previous year. This decrease had taken place in the morning classes, and not in the artisan classes, a greater number of whom now attend the school than at any former period; the average monthly evening attendance during the past year being 142. In addition to the instruction given in the school, elementary drawing is taught by a master from this school in four of the public schools in the town. The Railway School, in which drawing is now taught by its master, is also in connection with the central school, so that 560 children have now instructionin drawing.

CHELMSFORD WATER-SUPPLY.—The surveyor to the Chelmsford Board of Health (Mr. Chancellor), in a report to the Board, says,—"The town of Chelmsford, with the suburbs included in the water district, includes at the present time above 1,600 houses, with probably an average population of five persons per house, giving a total of 8,000 inhabitants: of these about 1,200 houses, representing a population of 6,000 persons, are connected with the water mains of the Board of Health. From a series of experiments and calculations I have made, I find that at six o'clock in the morning, the time we commence pumping at the waterworks, there are about 44,000 gallons of water in the deep well and the tunnels connected therewith, which quantity has accumulated in the eleven previous hours. With our new pumps, we empty the well and tunnels in five hours; but, as during that time the water is still flowing from the bore pipes at the rate of 60 gallons per minute, the total quantity pumped out in the five hours is about 62,000 gallons. During the remaining eight hours of the day we slacken the speed of the engine, or stop altogether for a short period, to allow the water to accumulate, and assuming that the bore pipes yield during this period at the average rate of 70 gallons per minute, a further quantity of about 33,000 gallons is forced into the town, making a total quantity of 95,000 gallons pumped up during the thirteen hours, from six o'clock in the morning till seven in the evening. From this statement it will be seen that 6,000 persons are at present consuming 95,000 gallons per day, or about 15 gallons per head: if all the houses were attached to the mains, the average for each person would be reduced to about 12 gallons per head." The surveyor recommends an increase of the supply, and points attention to various sources, and particularly to an artificial lake or reservoir, with springs, called the Railway Lake. One object in view is to give a constant supply at high pressure. At present an interval occurs every day, between 4 and 10 p.m. when there would actually be no water wherewith to extinguish any fire that might occur,—at least till a messenger was sent to Long Stumps, a distance of a mile and a half. An electric telegraph would be desirable under such circumstances; but a constant water supply would be infinitely better.

GRACECHURCH-STREET.—Being a weekly reader of your valuable journal, allow me to claim a short space to advocate some alteration to improve the thoroughfare of Gracechurch-street, which is still very much crowded by a very heavy traffic: my suggestion is simply to pull down and set back several of the fronts of the houses on each side, to form a stand for the omnibuses: the expense to be defrayed by an annual charge upon each of the proprietors, equal in the whole to the yearly value of the outlay made by the City in the extension.

J. G. S.

SPONTANEOUS COMBUSTION.—A remarkable instance of spontaneous combustion has taken place at the works of the Chartered Gas Company, Brick-lane, St. Luke's, by which several hundred tons of coals will be greatly depreciated in value, if not rendered comparatively worthless. It appears that the company have always an enormous stock of coals on hand, and to preclude any accident these are kept under cover, in fireproof sheds. It is, however, supposed that a quantity of wet coal had been stowed unobserved amongst the dry, which has caused the latter to heat, resulting in the ignition of the enormous mass, which, although it has not burst into flame, is smouldering away internally. It is stated that the loss occasioned by the combustion will exceed 1,000*l.*

PROGRESS OF THE VICTORIA STATION AND PIMLICO RAILWAY WORKS.—At the first ordinary meeting of the shareholders of the Company for establishing the Victoria line through Pimlico, the engineer's report was read, of which the following is an abstract: The contractor, Mr. Kelk, lost no time in building offices, ordering and procuring timber, erecting staging, travellers, crabs, cranes, pile engines, &c. From the magnitude of the bridge across the Thames, all exertions have hitherto been principally directed to that structure, and already considerable progress has been made. The coffer dams for the abutments and piers are being rapidly erected, and nearly 40,000 cubic feet of timber have already been driven for that purpose by two steam pile engines and eight smaller ones. The sites of all the piers have been dredged down to the clay by steam dredgers. The delivery of stone has become a regular work, and nearly 10,000 cubic feet are now on the ground, being dressed in sheds erected for the purpose. The foundations have been put in for the abutment on the north side of the embankment-road leading to Chelsea Suspension Bridge, and in a short time they will be brought up to the surface of the ground. I see no reason whatever to doubt that the time named in Mr. Kelk's contract (June 1860) will be observed. The hotel which the Company were to erect is in abeyance on account of the probability that all available space will be required for the station, and it is even contemplated that in consequence of the junction through the west of London with the Great Western and other north-side lines and other requirements, the bridge itself may require to be widened.

THE POWERS OF VESTRIES: THREATENING TO DEMOLISH.—A case came on in the Vice-Chancellor's Court last week—Clarke *v.* Paddington Vestry—in which the plaintiff presented a bill praying that the defendants might be restrained by injunction from demolishing, destroying, altering, or injuring twelve houses erected by plaintiff in Spencer-street, Paddington, or any of the drains connected therewith, or from preventing the completion of said houses, &c. The plaintiff had formed three streets—Delamere-terrace, Cirencester-street, and Spencer-street,—and imagining that he was bound to form a sewer, he did so, but afterwards called upon the defendants to construct a continuation of the same to Spencer-street, which the defendants, by their vestry-clerk, refused to do, ordering him to complete the sewer, threatening their power to demolish the plaintiff's buildings, and forbidding him to go on with them. The defendants, however, had now discovered that they had no such powers to compel plaintiff to form the connection between the sewers. The Vice-Chancellor, in giving his decision, said it was a serious mistake for a vestry, armed with enormous powers to demolish buildings, that they should proceed in such a way, without being sure of the grounds on which they acted. As the plaintiff is successful, added the judge, I must direct that the defendants do pay his costs; but I cannot help adverting to the circumstance that the plaintiff is himself a parishioner of the parish of Paddington, and that the costs of this litigation, which has been improperly caused by the unjustifiable act of the defendants, who seem not to know what their powers are, except that they are determined to exercise to the utmost, whenever they see an opportunity, the powers which the Legislature has conferred upon them, will be discharged by a rate to be levied on the parish to which the plaintiff himself must contribute his proportion. That is a great injustice, and one which I hope the Legislature will provide the means of remedying. It cannot be consistent with justice that persons exercising public functions recklessly and by mistake should make the injured person bear his proportion of the costs in obtaining that very justice and seeking that remedy to which they compel him to resort in order to have his rights protected.

LEAMINGTON SURVEYORSHIP.—There were forty-three candidates for the above, from whom, at the meeting of the local Board of Health, held on the 18th instant, Mr. Anthony Morgan, C.E. was elected.

REPEAL OF THE PAPER DUTY.—One hundred members of Parliament have now identified themselves with the Newspaper and Periodical Press Association for obtaining the repeal of the paper duties. This amount of strength, organised without fuss or noise, and in the course of a few weeks, speaks well for the cause. Nothing succeeds like success, says the French proverb. Now, an agitation that starts with 100 vice-presidents, each writing M.P. behind his name, must be held to have commenced its career with a very remarkable success. The rest will follow. Arrangements are in progress for a deputation to the Government,—and it will include leading men connected with the press of Scotland and Ireland, as well as of England.—*Athenæum.*

LOCOMOTIVES IN STREETS.—A correspondent of one of the morning journals calls attention to the fact that a railway traverses the whole length of the city of Genoa, through one of its finest streets. He says:—"The portion of the public way devoted to the railway is simply divided off by a plain iron railing, coming to the height of a middle-sized person's waist. The trains pass to and fro at short intervals, not only by day, but also after dark, without causing any alarm to the horses or danger to foot passengers, although the whistle of the locomotive is as loud and shrill, the steam clouds as abundant, and by night the sparks and flames from the furnace as formidable as elsewhere. At the endless crossings a chain is quickly hooked on as the train passes, and as quickly allowed to fall again, without, apparently, taxing in any degree the patience of the crowd; and certainly the stoppage is neither so long, nor so vexatious, nor so dangerous as at the two crossings at the extremities of St. Paul's-churchyard, or at the bottom of Ludgate-hill. The Genoa Railway does not take passengers: it is reserved for the conveyance of heavy merchandise from one part of the port to the other."

THE DISPUTES IN THE GLASS TRADE.—It is to be regretted that these unfortunate disputes still continue in the Midland districts. The original cause of the differences has not been removed, although the operatives, at a recent meeting, made certain alterations in the rules by which their trade society is governed. The employers have not accepted the modified rules, because they consider that, in reality, no concession has been made by the workmen, and that, in fact, the particular rules are as arbitrary as they were previously. The employers are to hold another meeting, at which a final decision will probably be arrived at. Though at the present time the cutters have not ceased working, they will shortly be compelled to do so for want of material. Thus, a large body of men, who really are not involved in the disagreement, will be deprived of the means of earning their daily bread, and the result will be deplorable. There are now upwards of twenty manufactories in Birmingham and the district at a stand-still, and it is not unlikely that this number will now be considerably augmented. A new feature has arisen in the lock-out which will render it probably of long duration. The glass bottle-makers, who have a powerful society, have volunteered to assist the flint glass hands, and are commencing a regular contribution for this purpose. It seems that the cost to the society of the lock-out of the flint glass hands will be from 300*l.* to 400*l.* a week, as there will be about 600 men out of work.

THE LATE MR. BELSHAW.—We are sorry to find that the widow and children of the late Mr. Belshaw are in want. Mr. White, of Richmond-street, St. George's-road, who is exerting himself in their behalf, reminds the public that it was Thomas Belshaw who first originated and practically carried out exhibitions of arts and manufactures, first at Manchester, then at Liverpool, Derby, Sheffield, Macclesfield, Devonport, Hull, and other places; who successfully organised the First Great Industrial Exhibition at Bingley House, Birmingham; and was largely instrumental to the success of the Great Exhibition of 1851. "Then followed the Exhibitions of Cork and Dublin, where his energy and talent so greatly contributed to their success. Lastly, the Crystal Palace at Sydenham;—whence he was appointed deputy storekeeper to the Army Works Corps; and it was whilst going out to the Crimea in charge of the 3rd division, with which he sailed in the *Berwick* transport, December 2nd, 1855, that he met with the fearful injury which, combined with anxiety, disappointments, and neglect, has caused his untimely death."

COLOURED GLASS.—Allow me to suggest a very cheap and effective substitute for painted glass. It is gelatine, of which little lamps are now made for illumination, with capital effect.—W. H.

MONUMENTAL BRASSES.—On Tuesday evening the Rev. G. B. Miller, of Grimsby, delivered a lecture in the City Assembly-rooms, Lincoln, on "Monumental Brasses." Mr. Sheriff Smith occupied the chair. The walls of the room were hung with drawings, or rubbings from various monuments.

IRON AND HARDWARE TRADES' PENSION SOCIETY.—In the hope of aiding, we mention that the third ball in aid of the funds of the Iron, Hardware, and Metal Trades' Pension Society, will take place at Willis's Rooms, King-street, St. James's, on Thursday, the 27th inst.

CONVERSAZIONE AT WOLVERHAMPTON SCHOOL OF ART.—A meeting of the donors and annual subscribers to this school has just been held. Mr. Wallis delivered an address, in which he called attention to the drawings on the walls, and explained some proceedings in the Schools of art; urged the necessity of a cultivation of the public taste as well as of that of the students, and expressed a regret that the subscriptions to the Wolverhampton School had fallen off. Mr. Wallis concluded his address with some practical remarks on designs of articles in common use. The mayor and other gentlemen also addressed the meeting; urging the necessity of giving better support to the school; but it unfortunately happens in such cases that it is precisely those who do not need much urging who are within earshot, while it is precisely those who do require it that stay away. Some better mode of reaching the delinquents is much wanted.

A NEW SITE FOR THE LAW COURTS.—The site of the Foundling Hospital, at the head of Guildford-street, is suggested by our correspondent, "M. T. W." as a suitable one for a magnificent edifice, and he suggests that the new law courts could not be better placed than there, in the vicinity of those squares and streets where gentlemen connected with the law reside, as well as in the Inns of Court themselves, which also are at hand. The Foundling Hospital, in such a case, had better be removed out of town altogether. The site is certainly a noble one, but not the best as we think for the Law Courts.

SUBMARINE WAR-ENGINE.—An American has visited England with the model of an extraordinary sub-marine boat, which, say the morning papers, possesses advantages far greater than those of the best diving-bell, and combines with these the agencies of the most terrible floating batteries. Sir Baldwin Walker has had interviews with the patentee's agent, and if the invention should be found to answer, it is said that it will completely revolutionise naval and coast warfare, and that the defences of Cherbourg and Portsmouth would avail nothing against this submarine monster. It reminds us of the famous smuggler, Capt. Johnson, who proposed, by means of a submarine boat or vessel, to convey the first Napoleon from Elba back to France. Nothing great, however, was ever done with Capt. Johnson's invention.

BIRMINGHAM AND MIDLAND COUNTIES ART-UNION.—The ballot of the Royal Birmingham and Midland Counties Art-Union took place last week at the rooms of the Society of Artists, New-street, Birmingham, the Mayor (Sir John Ratcliff) presiding. The report, which was read by Mr. Hallam, one of the honorary secretaries, stated that the committee had the satisfaction of informing the subscribers that the receipts on the present occasion were considerably larger than those of last year. The removal of the Society of Artists to the building which they now occupied would admit of the commencement of operations in future at an earlier period of the year. The total amount of subscriptions was 342*l.* 18s. From this sum 32*l.* 18s. had to be deducted for expenses, and 310*l.* were consequently available for the ballot. The committee appropriated this in the following manner:—One prize of 50*l.*; one of 30*l.*; two of 25*l.*; three of 20*l.*; three of 15*l.*; six of 10*l.*; and three of 5*l.* The prizes were distributed accordingly by ballot after the report had been adopted.

TENDERS.

For forms and benches, Exchange-hall, Stamford. Mr. Edward Browning, architect:—

Oliver, London	£270	0	0
Sands, ditto	135	0	0
Warne, ditto	135	0	0
Cogswell and Day, Peterborough	116	5	0
Branston, Kibworth	100	10	0
Littledike, Stamford	98	0	0
Hammer, London	85	10	0
Cave, Oakham (accepted)	83	0	0

For a public-house at Poplar. Mr. J. Harrison, architect:—

Day	£1,175	0	0
Ring and Stanger	1,060	0	0
Hill and Son	1,048	0	0
Wm. Smith	1,027	0	0
Brake	955	0	0
Pitsford	900	0	0
Green	897	0	0
Harrison	793	0	0
Ennor	778	0	0

For workshops for Messrs. Whickar and Blaise, St. James's-street. Mr. Sydney Howell, architect. Quantities supplied:—

Tyler	£630	0	0
Fiske	610	0	0
Greig	587	10	0
Bowley, Brothers	492	0	6

TO CORRESPONDENTS.

A. B. C. (accident in Cork was mentioned last week).—J. H. (asphalte could not be efficiently used for such a purpose: blocks of concrete have been so used. Consult an architect).—T. J. H.—J. M. Inspector of Works (we do not know. An advertisement in our columns would probably meet his eye).—W. H. (should obtain prospectus from the various societies). C. M.—J. R.—J. F. M.—W. M. (we should like to see the paper).—J. R. C.—J. G. S.—S. J.—An Architect.—H. S.—Dr. W.

ERRATUM.—In the third column of p. 40, for "the 'skylight' of which is broken by dormers," read, the *skyline*.

"BOOKS AND ADDRESSES."—We are forced to decline pointing out books or finding addresses.

☞ ***NOTICE.—All Communications respecting Advertisements, Subscriptions, &c. should be addressed to "The Publisher of the Builder," No. 1, York-street, Covent-garden. All other Communications should be addressed to the "Editor," and NOT to the "Publisher."***

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The Publisher will feel obliged by Subscribers forwarding the amount of their Accounts up to the end of 1858.

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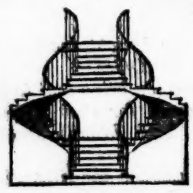

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